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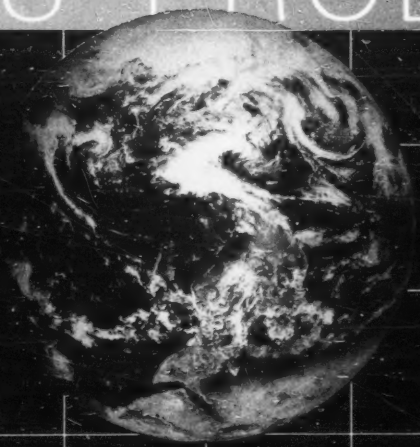

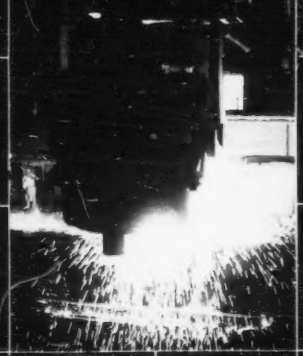

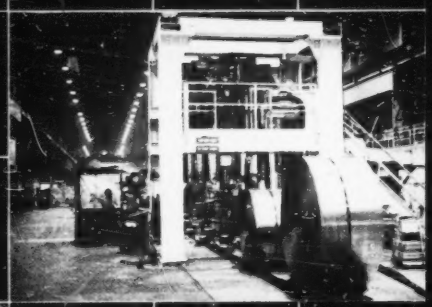

WORLD STEEL REPORT

BRINGING SUPPLY IN LINE WITH DEMAND

KAWASAKI UNVEILS ITS THIN SLAB CASTING PROCESS

STEEL SPENDING IN 1985—A PICTORIAL REVIEW

THIRD QUARTER STEEL AND NONFERROUS EARNINGS

DECEMBER 6, 1985 VOL. 228, NO. 23

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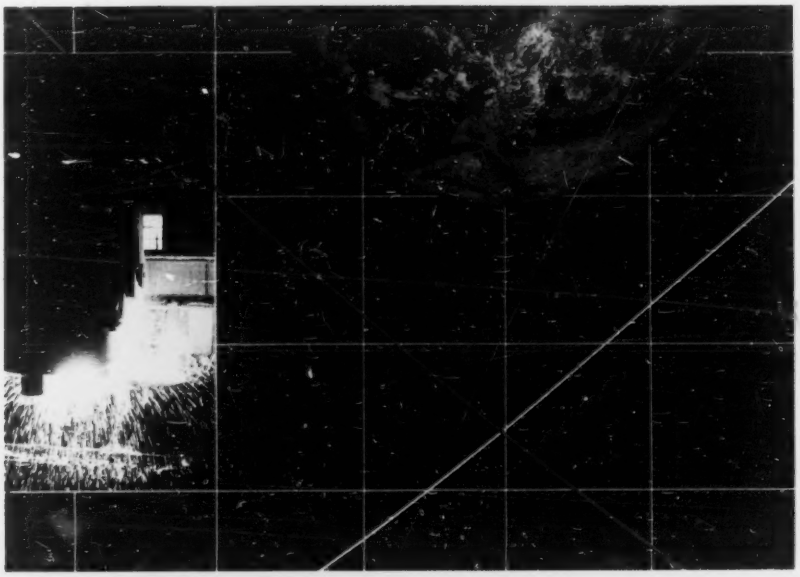

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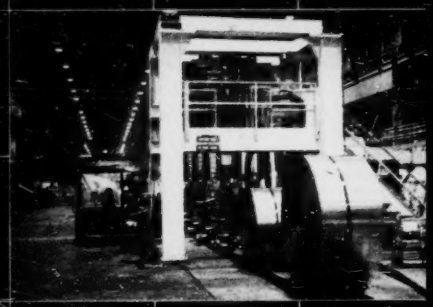


WORLD STEEL REPORT

BRINGING SUPPLY IN LINE WITH DEMAND

BY GEORGE J. MCMANUS

"You light a candle at every altar," said Donald H. Trautlein, chairman of Bethlehem Steel Corp. and also chairman of the American Iron & Steel Institute.

Mr. Trautlein was talking about steps that could be taken to force foreign countries to limit their steel shipments to the U.S.

He cited Presidential action, legislation, and trade suits as measures to be directed against any nation that failed to comply with the Reagan's Administration's program of voluntary restraint.

"All hell will break loose," he said when asked about the consequences of foreign feet dragging.

It did appear that there were enough candles and enough altars to make it likely the flow of steel into America would be slowed. The day was past when the trade complaints of American steelmakers could be dismissed as the mouthings of an isolated, backward industry.

The basic steel industry now had lots of company. The U.S. trade deficit was running at an annual rate of more than $130 billion. Producers of semicon-

World Steel Consumption

Industrialized Countries
Million Metric Tons

	Average 1977-1983	1985E	1990F	1995F
N. America	136	122	109	104
EEC	102	93	91	90
Japan	71	73	73	73
Other Ind.	44	43	44	46
TOTAL	353	331	317	313

Developing Countries
Million Metric Tons

	Average 1977-1983	1985E	1990F	1995F
Latin America	31	28	35	40
Asia	39	51	60	66
Africa	10	11	12	13
Middle East	16	14	16	18
TOTAL	96	104	123	137

E = Estimated
F = Forecast

Source: IISI

ductors, electric razors and other high tech items were among those crying foul. Growing protectionist sentiment within Congress showed up when the House approved a textile quota by a vote of 262 to 159.

Apart from pressures that could be brought to bear within the U.S., a number of external factors pointed toward more orderly conditions in the world steel market. For one thing, world demand was expected to level out.

"The demand for steel products in the major industrial countries is likely to be relatively stable over the next decade," said Lenhard J. Holschuh, secretary general, International Iron & Steel Institute (IISI).

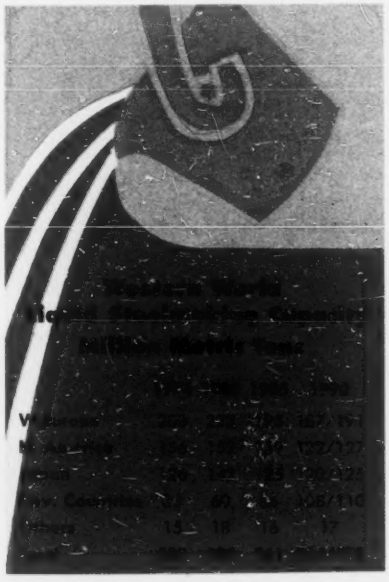
Mr. Holschuh saw little prospect of growth, but if he's right, the big steel nations should at least avoid the kind of market contraction that made the last few years so difficult. From 442 million metric tons in 1979, crude steel output of the industrial nations fell to an estimated 331 million tons in 1985.

Raw steel output will probably come down a little over the next 10 years, said Mr. Holschuh, but mostly because the conversion to continuous casting will mean the same amount of finished product can be made from less liquid metal.

World demand is stabilizing and steelmaking capacity is being brought into better balance with demand. From 1980 to 1985, capacity was reduced by 28 million tons in Europe, 23 million tons in North America, and by 17 million tons in Japan (all metric).

Less Capacity

Steel executives think more capacity should be subtracted. Mr. Trautlein indicated that the U.S. industry would need to shed another 20 million tons of raw steel production. There will probably be more cuts, but the shutdowns to date have restored the market balance of five years ago. In both 1980 and 1985, Western World producers operated at about 78 pct of capacity.



The cause of harmony was also being promoted by the mellowing of foreign steel producers. At the recent London meeting of IISI, there were none of the angry recriminations that have marked past sessions of the organization. The atmosphere was conciliatory, although Mr. Trautlein did use pretty strong language in setting forth the U.S. position.

"The U.S. government stands alone among nations in permitting up to 20 pct of our country's steel requirements to be supplied by imports," he said. "No other major steel producing nation in the free world is even a net importer."

Mr. Trautlein said it was absolutely essential that a new agreement covering European steel exports be wrapped up by the end of October.

There was no talk of retaliation at the IISI meeting. Even the West Germans, who considered themselves blameless, seemed to accept the Reagan program as inevitable. "It is not protectionism," said Henrich A. Kriwet of Thyssen Stahl. "They have a right to defend themselves."

While free trade proponents in the U.S. glossed over unfair tactics and attributed all problems to domestic inefficiency, it was taken for granted abroad that massive subsidies exist. Some of the strongest testimony in this regard came from

those who protested their own innocence.

"I am not subsidized," said Herbert Gienow, chief executive of Klockner Werke. "I am caught in the solidarity of the European community."

While arguing that he was being punished for the sins of others, Dr. Gienow freely acknowledged that there was a lot of sin in the world steel industry.

"The American steel industry is happy that subsidized steel has to cross 5,000 kilometers before it comes to the U.S.," he said. "For us, it has to cross but 50. The same subsidized steel is coming into Germany from Italy. They are receiving the most terrible amounts of government money."

There were other complaints at the IISI session, but it was all low-key. Swedish steel producers made a mild protest against a ruling that their country's shipments of cold rolled sheet to the U.S. should be subjected to an 8.77 pct countervailing duty.

Mild protest

The protest was so mild that it took considerable press prodding to draw a critical comment. "We don't think it is subsidy," said Henry Lundberg, president of SSAB, of the assistance given his company. Mr. Lundberg called the U.S. ruling "too harsh."

He suggested that some consideration should be given to Sweden's free trade policies. "Our borders are very open," he said. "We don't have any duties."

Sweden has no tariffs, but it does recognize that trade can be unfair and it is acting now against steel imports. "There are some dumping cases," said Mr. Lundberg.

Canadian officials argued that they, too, were victims, not villains, in the world market. The Canadian market is open, they said, and Canadian mills don't dump.

A top official said the U.S. and Canada should join in a trade arrangement that would protect the North American standard of living. He was against quotas on the grounds that they permitted trade abuses to continue. Dumping cases are being processed in Canada.

In short, a lot of people felt they were in the same boat as the U.S. The inference seemed to be that others were taking their lumps while only the U.S. was crying for special treatment.

"You are complaining successfully because your government gives you some protection," said Dr. Gienow. "Ours cannot."

Mr. Trautlein noted, again, that there was another important difference between the U.S. situation and that of foreign countries. "When somebody tells you we import 5 million tons," he said "that's great, but they are exporting 7 million or 8 million tons. In our case, our 25 million tons of imports are offset not at all by exports."

There was still some bickering, but it looked as though the apparatus for controlling U.S. imports would soon be in place. As of late October, voluntary restraint agreements had been signed by 14 nations and the Common Market. There was optimism about a European steel treaty.

None of which meant the control machinery was certain to work. The Administration's steel program was supposedly launched in October 1984. Through bilateral voluntary agreements, the program aimed at limiting imports of finished steel to 18.5 pct of the U.S. market. Another 1.7 million tons of steel in semi-finished form was to be permitted.

Twelve months after the 1984 effective date there had been no real decline in steel imports of the U.S. Through September 1985, the 26 pct foreign share of the U.S. market was almost identical with the 1984 slice in the same months.

It could be argued that the absence of an import decline was due to delays in the negotiation of agreements. That was a factor, but the big problem was a rise of nearly 1 million tons in European shipments over the first nine months of 1985. This was discouraging because European steel was fully covered by an agreement signed in 1982.

Is protectionism 21 pct of the U.S. market or 7 pct of the E.C.?

At the recent London meeting, one speaker noted with satisfaction that the European Common Market had succeeded in limiting its steel imports to 7 pct of supply.

Later at the same meeting, the proposed steel import curbs of the U.S. were criticized as protectionist by Dr. Vorwerk, professional head of Eurofer. This brought a response from Peter B. Mulloney, vice president and assistant to the chairman, United States Steel Corp.

"I said I guess I have a language

'There will be intense competition with imports and between domestic producers.'
Peter B. Mulloney
U.S. Steel Corp.

Judging by early experience, the new steel agreements could be equally porous. "We have about 80 countries now exporting to the U.S.," said Mr. Trautlein. "Some of them don't even have steel plants."

The same point was made by John Meagher, vice president, government relations, LTV Corp. "There are 18 countries with no steel mills which are now importing steel into America," said Mr Meagher. "And important countries like Canada,

problem," said Mr. Mulloney. "The U.S. tries to cut back from 26 pct of its steel market supplied by imports to 21 pct and Dr. Vorwerk says that's protectionism. The EC maintains imports at 7 pct of its market and that's not protectionism."

"Dr. Vorwerk went all around the bush and he ended up saying: 'Well, of course, it's protectionism but we need it for our restructuring.' "

This exchange is an example of the kinds of assertions and assumptions American steelmakers face in their fight for trade curbs. In a far ranging interview, *Iron Age* put some of the fundamental questions to Mr. Mulloney.

Iron Age: *Most people now work in government, finance and other service areas. Do we really need a steel industry or any manufacturing?*

Mulloney: You can't run an economy and improve living standards unless you add value. Real value is added in the transformation of raw materials into products. That is what has improved mankind's living standards all over the world.

I don't think you can maintain the strength of the United States—I don't just mean military strength, but all the strengths that have made the United States the defender of the free world—I don't think you could do that with a service economy. I don't think you can sit back and say we're going to run our banks and deal in Toyota motor stock and be able to protect the free world. We're not a Switzerland.

Iron Age: *If we restrict imports, aren't we depriving consumers of low-priced foreign goods?*

Mulloney: In the short term, yes. In the long term, it is questionable because if you wipe out the manufacturers here, will the imports still come in at that low price when there is no longer the need to compete with the domestic manufacturer?

Secondly, the health of the consumer isn't governed totally by the prices of products. If low-priced imports are reducing the health of the economy overall through creation of unemployment and the need for higher taxes for unemployment compensation, then the consumer isn't befitting.

Thirdly, if low-priced goods are coming in on a dumped or subsidized basis, it's against all our laws and any natural trading principle. You don't benefit in the long run by having predatory pricing.

Iron Age: *Won't manufacturers of auto, machines and other products be placed at a competitive disadvantage if they are deprived of low-priced foreign steel?*

Mulloney: You certainly will increase the cost of steel to the manufacturer, but I think the effect is pretty slight. A slight increase in the cost of steel doesn't have an awful lot of effect on an automobile that sells for $8,000 or $10,000. And if the price of material is less than it costs to make it, that situation can't continue long.

(Like consumers, said Mr. Mulloney, manufacturers would have to pay premium prices for imports if domestic sources were eliminated by trade.)

Iron Age: *But won't domestic steel companies take advantage of trade curbs to jack up their prices?*

Mulloney: When you figure that under the President's program, 21 pct of the market is going to imports, there's no way for arbitrary pricing to take place. There will be intense competition with imports and between domestic producers.

Iron Age: *Aren't the industry's trade problems due to inefficiency?*

Mulloney: It's pretty clear today from outside observers that the U.S. industry is more efficient (than Europe). At Gary Works, the flat rolled operation is at the same level or better than the Koreans.

(Mr. Mulloney recalled the old argument that trade problems would be confined to a few backward inefficient industries.) We've all heard over a period of years that this smokestack industry can go away because high tech will succeed. The *Times* this morning had a story saying that American producers of chips have given up. Texas Instruments just announced that *it is* closing two plants.

Iron Age: *Granted there are problems today, but isn't free trade the ideal we should be striving for? Isn't free trade inherently better than protectionism?*

Mulloney: The whole underpinning of free trade—the theory of comparative advantage—falls apart when you have government involved.

You don't have free trade. It is largely managed trade. There has been entirely too much theory applied to the whole problem and not enough discussion of what is actually taking place.

Argentina, Austria, and Sweden have refused to bargain."

Specialty steel producers charged that their own tariff and quota programs were being shredded by a wide range of fraudulent tactics. The specialty industry's charges were aired in Washington by Richard P. Simmons, president of Allegheny Ludlum Steel Corp.

Mr. Meagher noted that the U.S. Congress had committed itself to attainment of the Reagan Administration's steel import targets.

"We urge the introduction and enactment now of legislation codifying the President's own program at a 20 pct level and requiring him to embargo shipments from those countries which fail to agree to a voluntary program," he added.

LTV's financial situation pointed up the need for prompt action. The company's inability to fund its pension plan had necessitated a waiver by the Internal Revenue Service.

It might already be too late for the Reagan program to do much good. Armco Inc. was projecting a sharp drop in imports—from 23.1 million tons in 1985 to 19.1 million tons in 1986. However, an even sharper decline in consumption of steel was seen lowering shipments of domestic mills to 66 million tons in 1986. In 1983, with shipments of more than 67 million tons, the steel industry lost more than $3.5 billion.

(Cont. on p. 26B6.)

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COMBUSTION ENGINEERING

A strong domestic market in 1986 could create a different set of problems. If demand is strong enough to support the steel price increases proposed for January, there will no doubt be charges that domestic mills are taking advantage of trade protection to soak customers.

Steel men were doing little worrying about demand being too strong or their prices too high. It was possible, however, that the threat of a steel strike could tighten supply for a brief period in 1986. Labor contracts of the biggest mills expire next year, and management is determined to get concessions from United Steelworkers of America (USWA).

In the old days, strike 'hedge' buying could add 10 million or 12 million tons to steel shipments in the six months before a contract termination. The shortages created by inventory buying opened the door for imports, and eventually led to the adoption of a no-strike clause in the steel contract.

That clause has been discarded and there could be a steel strike in 1986. It's difficult to imagine that this possibility will send people rushing out to buy extra steel. Not with a world surplus and with domestic mills bargaining individually this time. Nevertheless, an inventory boom could develop. With supply tightening, there would be agitation for relaxing the import controls.

Even a modest rise in demand might turn up bottlenecks in the steel system. For a number of years, there have been warnings of an impending coke shortage.

"The industrialized nations have reduced coking capacity by 42 million metric tons or 19 pct since 1981," said Frank W. Luerssen, chairman of Inland Steel Co. "The most dramatic change has occurred in the United States where 21 million tons of capacity has been retired since in the past four years.

In his IISI report, Mr. Luerssen added that the average age of coke ovens was 15.5 years throughout the world and 19.3 years in the U.S. He noted that investments in new coking capacity were unattractive.

Despite the subtractions and old age, Mr. Luerssen felt there would be plenty of coke. "We see a surplus condition extending far into the 1990's," he said.

What might develop is a shortage of the kind of steel demanded by customers. When Tuscaloosa Steel set out to buy semifinished steel for its new plate mill, the company was unable to line up continuously cast slabs from domestic sources. The continuous cast portion of U.S. production was still under 40 pct in 1984. Accordingly, Tuscaloosa Steel turned to British Steel for slabs.

Continuous casting represents just one part of a broad push for better quality. The large steel users are demanding ultra clean material, produced to close tolerances.

The quality drive showed up in IISI technical papers on the upgrading of rolling mills. Some fairly drastic innovations have surfaced, particularly in the hot strip mill area. Domestic producers will have to implement the new technology or face complaints that import curbs are depriving users of world-class quality. □

3RD QUARTER EARNINGS
PROFITS ELUDE THE METALS INDUSTRIES

BY GEORGE J. MCMANUS AND ROBERT REGAN

Stiff price competition, weak demand and a steady flow of imports trimmed the steel industry's earnings in the third quarter. Nonferrous metals producers also turned in a lackluster report.

Steel

Carpenter Technology Corp. lost money in the third quarter. Bethlehem Steel Corp. skipped a dividend for the first time in 46 years.

United States Steel Corp. bought another energy company and was pondering a name change. Wheeling-Pittsburgh Steel Corp. was trying to claw its way back from bankruptcy and a 98-day strike.

In other words, these are unusual times for the steel industry. In the third quarter, things were unusually bad—bad enough for even Carpenter to lose money. Carpenter had earned 7.8 pct and 11.4 pct on equity in its last two fiscal years. The company had a net loss of $2.3 million in the third quarter.

"We expected lower sales for this current year's first (fiscal) quarter," said Paul R. Roedel, president of Carpenter, "but not to this extent."

Mr. Roedel said volume was being impacted by direct imports and by imports of manufactured products. "We believe a further rise in demand for capital goods will happen," he said, "but a significant portion of that demand will continue to be met by imports."

U.S. Steel's proposed acquisition of Texas Oil & Gas Corp. drew a certain amount of flak on the grounds that the new stock to be exchanged will dilute shareholder values.

The criticism was puzzling because the steel portion of U.S. Steel had an operating loss of $4 million in the third quarter. Any dilution of the deficit wouldn't be all that bad.

U.S. Steel spelled out the extent of the price erosion. Steel shipments of 3.2 million tons were up 15 pct from the third quarter of 1984, but transaction prices were down 10 pct.

"The sharp decline in transaction prices from the third quarter 1984 reduced sales by an estimated $167 million." said David M. Roderick, chairman of U.S. Steel.

Weirton Steel Corp. continued its winning ways in the third quarter. Weirton's 6 pct return on sales was the best for any integrated producer.

However, the company's worker-owners were warned against complacency. "The steel business is in turmoil," said Robert L. Loughhead, Weirton president.

Mr. Loughhead characterized the current pricing situation as "sucidal" and said he wasn't optimistic about the future.

"Prices may not have bottomed out yet," he added.

Armco continued its profit recovery in the third quarter. The company earned $48.6 million. There was a big lift from the sale of aerospace and strategic metals properties for $134.7 million.

Armco's carbon steel business had a small operating loss. Specialty steels had an operating profit of $11 million and fabricated product accounted for $17 million.

"We are naturally gratified to report two consecutive quarters of profit," said Robert E. Boni, president of Armco.

The third quarter was unkind to Bethlehem and to Inland Steel Co. Bethlehem reported a net loss of more than $76 million. Nearly half of this was due to a facility write-off, but the deficit was still hefty. Basic steel had an operating loss of $12.7 million.

Inland had a net loss of $51.9 million. There were various special charges, but Inland's integrated steel business had an operating loss of more than $36 million.

National Steel Corp. had an operating profit of $7.3 million with $4.2 million of this coming from an inventory reduction.

LTV Corp. lost $19.5 million in the third quarter and benefited from an exchange of debt.

The operating loss of $24.9 million on LTV's steel operations was down from both the second quarter and from the third quarter of 1984.

LTV eased some of the financial pressure it has been facing by negotiating a deferment on a payment due its pension fund.

The electric furnace steelmakers seemed to be doing fairly well. Nucor Corp., Florida Steel, and Laclede Steel all were profitable in the third quarter. Quanex and Lukens made money.

The grim third quarter returns made it doubly certain steel producers will be seeking concessions from United Steelworkers of America next year. Mr. Roderick said U.S.

(Sales and earnings table appears on the following page; story continues on p. 34B12.)

STEEL: LOW PRICES AND LITTLE DEMAND

THIRD QUARTER PROFIT REPORT—1985 (In Millions of Dollars)

		EARNINGS			SALES		
	1985 E/S	3rd Q 1985	3rd Q 1984	Pct Change	3rd Q 1985	3rd Q 1984	Pct Change
USS	2.0	100.0	153.0	–35.0	4,951.0	4,728.0	+4.7
LTV	—	(19.5)	(79.8)	—	2,023.0	2,049.9	–1.3
BETHLEHEM	—	(77.0)	(17.0)	—	1,294.8	1,363.0	–5.0
ARMCO	5.0	48.6	(272.7)	—	955.1	1,022.7	–6.6
INLAND	—	(52.0)	(40.0)	—	714.8	737.8	–3.1
NATIONAL	—	0.2	3.1	–94.0	512.2	563.6	+9.1
TOTAL	—	(27.0)	(207.6)	—	10,450.9	10,465.0	–0.1
CYCLOPS	1.8	6.0	4.2	+42.0	334.4	302.5	+11.0
WEIRTON	6.0	18.1	15.8	+15.0	297.0	256.0	+16.0
COPPERWELD	—	(14.6)	(4.8	—	277.3	349.1	–21.0
INTERLAKE	2.7	5.6	10.1	–45.0	204.0	211.8	+3.7
NUCOR	7.7	15.7	11.8	+33.0	202.6	165.5	+22.0
CARPENTER	2.0	2.3	3.6	–38.0	109.9	126.7	–13.0
LUKENS	1.2	1.4	1.3	+3.8	109.6	102.6	+6.8
FLORIDA	3.2	2.4	1.7	+48.0	76.3	73.7	+3.5
QUANEX	1.7	1.3	2.0	–35.0	76.1	99.8	–24.0
LACLEDE	1.2	0.7	1.4	–49.0	58.5	55.9	+4.6
CF&I	—	(3.7)	3.6	—	52.5	80.5	–35.0
EASTMET	—	(4.0)	(7.9)	—	50.0	52.2	–4.3

NONFERROUS: THE RED INK CONTINUES TO FLOW

THIRD QUARTER PROFIT REPORT—1985 (In Millions of Dollars)

	NET INCOME			SALES AND OTHER REVENUES		
	3rd Q 1985	3rd Q 1984	Pct Change	3rd Q 1985	3rd Q 1984	Pct Change
ALCAN	$7.0	$52.0	–86.5	$1,442.0	$1,348.0	+ 7.0
ALCOA	57.1	60.1	–5.0	1,269.5	1,429.1	–11.0
ALUMAX	13.0	33.3	–61.0	493.0	457.0	–7.9
AMAX	(88.2)	3.1	—	465.7	559.5	–16.8
ASARCO	(12.1)	(10.1)	–19.8	291.4	287.2	+1.5
BRUSH WELLMAN	4.6	10.9	–57.8	61.5	78.2	–21.4
COMINCO	(28.4)	4.0	—	316.3	404.1	–21.7
CYPRUS MINERALS	15.5	(31.0)	—	186.8	157.4	+18.7
ENGELHARD	9.5	25.8	–63.2	533.4	619.9	–14.0
FALCONBRIDGE COPPER	(1.1)	0.8	—	76.4	64.8	+17.9
FALCONBRIDGE LTD.	3.7	31.8	–88.4	219.2	185.5	+18.2
FREEPORT MCMORAN	50.7	21.3	+138.0	161.5	205.3	–21.3
HECLA MINING	0.8	(11.8)	—	21.6	21.5	+0.5
HOMESTAKE MINING	2.0	9.9	–79.8	90.6	84.5	+7.2
INCO	11.6	(31.6)	—	314.0	323.0	–2.8
KAISER ALUMINUM	(17.7)	(73.2)	+75.8	526.4	548.8	–4.1
NEWMONT MINING	6.5	12.2	–46.7	165.9	163.7	–1.3
NORANDA	(30.6)	(48.4)	+36.8	936.2	747.9	+25.2
OLIN	(205.1)	16.3	—	427.1	430.8	–0.9
OREGON METALLURGICAL	0.3	1.6	–81.3	11.2	13.9	–19.4
PAMOUR PORCUPINE	6.1	(2.7)	—	12.0	12.5	–4.0
PHELPS DODGE	6.4	(24.5)	—	210.2	196.0	+7.2
PINE POINT MINES	0.4	0.8	–50.0	29.6	25.8	+14.7
REVERE COPPER	(3.2)	10.4	—	104.5	144.9	–27.9
REYNOLDS METALS	(303.8)	39.3	—	875.8	940.7	–6.9
SHERRITT GORDON	(2.9)	(9.1)	+68.1	81.2	78.0	+4.1
VULCAN MATERIALS	28.7	28.7	—	274.1	266.9	+2.7

Alcan Aluminium, Ltd.: Net for the 1985 period includes $8 million credit from tax-loss carryforward; operating loss was $1 million. Net for 1984 period includes $9 million credit from tax-loss carryforward; operating profit was $43 million. **Aluminum Co. of America:** Equity income from unconsolidated units was $16.9 million in the 1985 period compared with a $3.2 million loss in the 1984 period. There was a $7.7 million foreign currency exchange loss in the 1985 period and a $3.9 million gain in the 1984 period. **Amax, Inc.:** Net for the 1984 period includes an extraordinary charge of $4.2 million from reversal of tax-loss carryforward. **Cominco, Ltd.:** Canadian funds. **Cyprus Minerals Co.:** Results for the 1984 period are pro forma basis; the company was spun off from Amoco Corp. July 1, 1985. **Falconbridge Copper:** Canadian funds. **Falconbridge, Ltd.:** Canadian funds. Net for the 1984 period includes a $28.4 million credit from gain on sale of stock and from tax-loss carryforwards. **Freeport McMoran:** Net for the 1985 period includes $32.9 million gain on sale of Freeport McMoran Gold shares. **Hecla Mining Co.:** Results for the 1985 period include $1.08 million loss from continuing operations and $1.87 million gain from discontinued operations. Loss for the 1984 period includes $10.6 million loss from continuing operations and $1.1 million charge for reversal of tax loss carryforward. **Kaiser Aluminum & Chemical Corp.:** Loss for the 1985 period includes $3.5 million from discontinued operations; loss for 1984 period includes $67 million from discontinued operations. **Newmont Mining Corp.:** Net for 1984 period includes $1.6 million from discontinued operations. **Noranda, Inc.:** Canadian funds. **Olin Corp.:** Results for 1985 period include $230 million charge relating to restructuring program and $19.1 million gain on disposal of discontinued operations. **Pamour Porcupine Mines:** Canadian funds. Net for 1985 period includes $6.2 million gain from sale of investments and $1.5 million benefit from tax-loss carryforward. **Phelps Dodge Corp.:** Net for 1985 period includes extraordinary gain of $1.5 million. **Pine Point Mines, Ltd.:** Canadian funds. **Revere Copper & Brass:** Loss for 1985 period is after $5.8 million charge reflecting $2.0 million settlement of liabilities and $3.8 million reversal of tax-loss carryforward credit. **Reynolds Metals Co.:** Loss for the 1985 period includes net charge of $313.5 million for writedown of certain assets. Net for the 1984 period included $11.6 million charge for shutdown of certain facilities. **Sherritt Gordon:** Canadian funds. Net loss for the 1985 period includes $3.5 million gain from insurance proceeds. Net loss for the 1984 period includes extraordinary charge of $4.2 million.

Steel's plants in the Pittsburgh area will have to have labor costs competitive with those recently negotiated by Wheeling-Pittsburgh.

Bethlehem Steel was hopeful of "reaching a restructured contract with our employees... well before July 31, 1986."

To make the outlook a little more gloomy, domestic producers learned that more than 2.5 million tons of steel were imported in September. With this kind of foreign volume, there was no way either demand or prices in the U.S. could recover.

Nonferrous

The 1984-85 business recovery continued to pass the nonferrous metals industry by during the third quarter. Gains in the profits column were few and far between and were, for the most part, either smaller losses or firms edging out of the red, as was the case with Phelps Dodge Corp. and Inco Ltd.

There was no discernible trend in the sales column, with 12 companies showing gains and 15 declines.

Metals producers were dogged by unresponsive prices, particularly in cases where the metal is traded on an exchange, and by competitive pricing from domestic and overseas competitors alike. The third quarter saw no runaway gains in producers' stocks, but consumers perceiving ready availability continued to live off lean inventories.

Production cutting over the past year or so failed to bolster aluminum prices. Output curbs mainly in the U.S. and some parts of Europe have been partly offset by greater capacity utilization in Canada, Australia and Latin America, slowing the inventory draw-down. The London Metal Exchange (LME) spot price for primary ingot trended downward in the period and then sagged in October.

LME nickel prices did likewise. Pricing for copper, lead, zinc, tin, molybdenum and other base metals during the third quarter wasn't much to write home about and things weren't going any better for the producers in October—even before the International Tin Council's dificulties cast a pall over hedge market values in the final days of the month.

North America's five largest aluminum producers—Alcoa, Alcan, Reynolds Metals, Alumax and Kaiser Aluminum—had an aggregate 8.5 pct shipment gain. Alcoa's shipments slipped 1.5 pct, combining a 9.3 pct gain in deliveries of primary aluminum products and a 4 pct drop in shipments of mill products. Alcan showed a thumping 46 pct gain in ingot shipments and a 19.9 pct gain for mill products, but its operating results were in the red.

Alumax reported a 24.5 pct gain in tonnage shipments, but its third quarter net was down 61 pct. Reynolds Metals managed a 2.2 pct gain in shipments but the third quarter highlight was a $387 million writedown of certain domestic facilities, principally alumina refining and aluminum smelting capacity.

Kaiser Aluminum, which substantially trimmed its third quarter loss compared with the same 1984 period, reported an 81.9 pct drop in ingot shipments and a 21.5 pct gain in mill product deliveries. Kaiser's shipments overall were down 9.5 pct in the quarter, however.

Alcoa Chairman Charles W. Parry said third quarter profits, although 5 pct under the same 1984 period, were still above expectations. He said ingot and mill product prices remained weak but the company's cost-cutting efforts were paying off.

Aluminum surpluses worldwide were declining slowly, he said, adding that it would take either more production cuts or a substantial increase in demand to accelerate the inventory run-off.

Phelps Dodge Corp. said its move back into the black reflected favorable unit costs and a slight improvement in prices compared with the third quarter last year.

Sales of copper mined by the company were up 36.3 pct in the quarter to 98,800 tons and also topped mine output amounting to 95,100 tons. In the first half of this year, the company's mine output topped shipments by 9 pct.

Asarco, Inc., noted that the average producer price for copper was up only 3.4 pct at 66.3¢ per lb, while the average price for silver fell 17.5 pct to $6.13 an oz.

The company also recalled 20 workers at its Silver Bell, Ariz., mill to process slag from the company's Hayden, Ariz., smelter. Slag normally is a waste product, but Asarco officials said slag accumulated during startup of a new oxygen flash smelting furnace at Hayden had enough copper content to justify processing into copper concentrates.

Amax Inc. said its $32 million operating loss in the third quarter, compared with $48 million in operating profits in the same 1984 period, reflected larger losses on molybdenum and precious metals operations and reduced coal earnings. Copper processing operations also were in the red. Amax said magnesium losses rose because of higher costs and lower prices depressed aluminum earnings.

Inco, Ltd., credited lower unit costs and better nickel prices for the $11.6 million profit registered in the third quarter compared with the $31.6 million loss sustained in the same 1984 period. Inco's third quarter nickel deliveries dropped 9.1 pct, while deliveries of copper were down 38.6 pct and deliveries of silver and cobalt were down 10.2 pct and 25.9 pct respectively. Deliveries of platinum group metals were about on par with the 1984 period.

Inco said its average realized price for primary nickel was $2.53 a lb, compared with $2.50 a lb in the second quarter and $2.40 a lb in the third quarter last year. Inco called on the LME to suspend nickel trading because of "undue influence" from the tin crisis and said it would not consider the LME nickel price a meaningful indicator as long as it was influenced by the tin situation.

The spot LME nickel price finished October at $1.8262 a lb, after having fallen to $1.7855 a few days earlier. The LME price averaged $1.9222 a lb in October, down from $2.0677 the month before and $2.2203 in August. In October 1984, it averaged $2.1532 a lb. □

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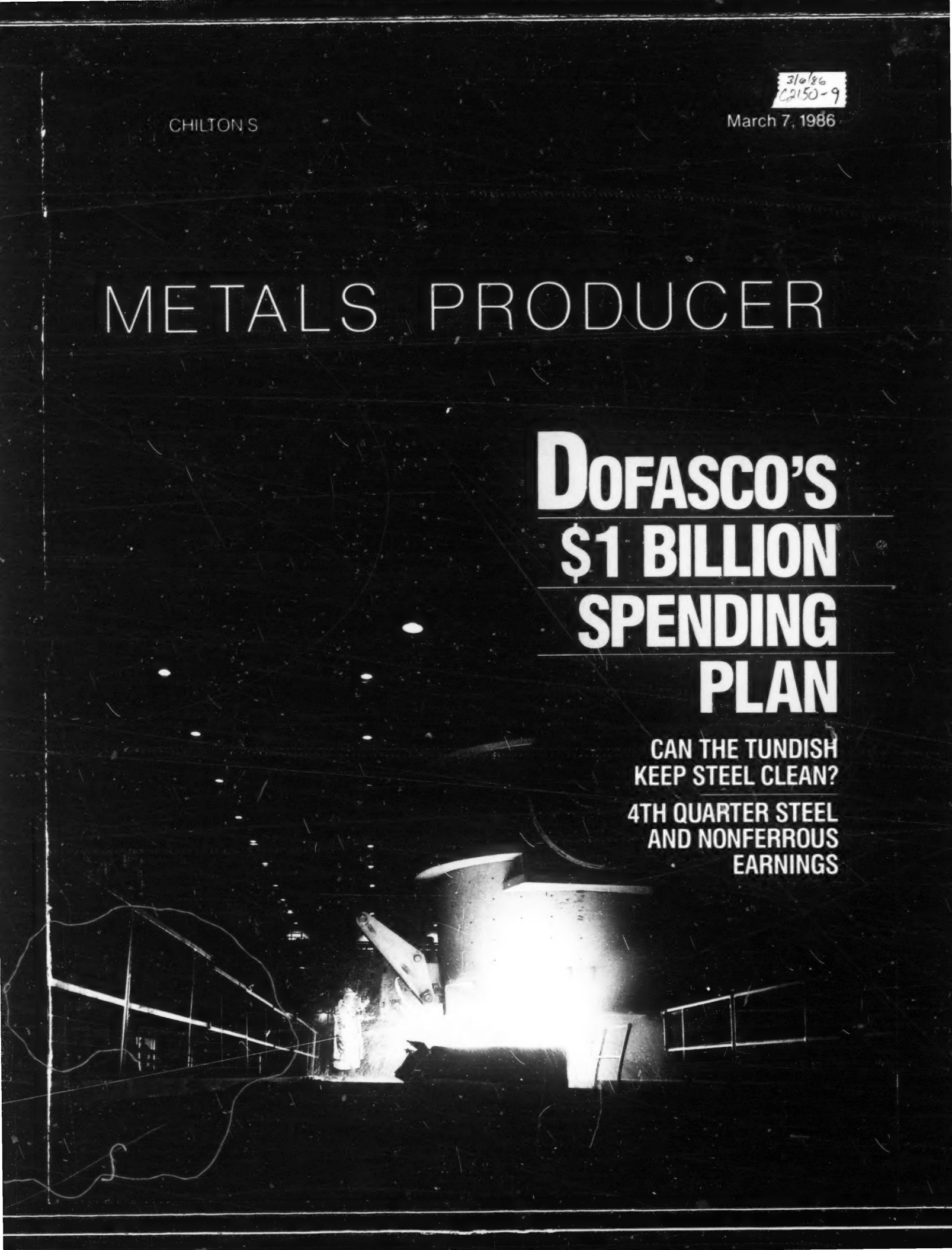

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4TH QUARTER STEEL AND NONFERROUS EARNINGS

MARCH 7, 1986 VOL. 229, NO. 5

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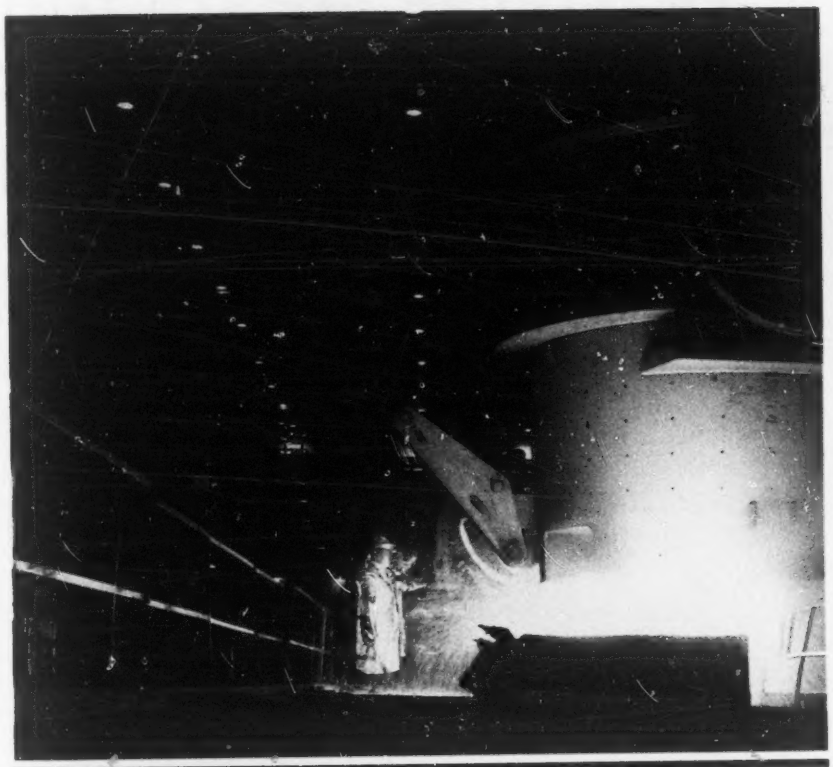

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4TH QUARTER EARNINGS
SOFT PRICES WEAKEN METAL PROFITS

BY GEORGE J. MCMANUS AND ROBERT REGAN

Sagging prices offset much of the steel industry's cost-cutting measures—and profits—in 1985. Likewise, price weakness kept many of the aluminum producers from posting better results.

Steel

In 1985, steel companies did a good job of documenting their need for cost relief.

The loss of more than $1 billion was the fourth straight annual deficit for the industry. This record gave management a powerful argument as it moved into contract negotiations with United Steelworkers of America (USWA).

The Steelworkers were well aware of the financial crisis. Shortly after LTV Corp. reported a 1985 loss of nearly $724 million, the union agreed to defer a 45¢ pay hike due Feb. 1 at LTV Steel.

There was a good chance all the mills would be able to reduce labor costs or at least stabilize them in 1986. Apart from financial considerations, a big wage settlement would leave the Steelworkers in a poor position to secure favorable government action on trade and economic matters.

There will probably be cost relief, but there's no guarantee this will solve problems. The steel companies have been cutting costs right along.

The labor cost per hour has declined and a lot fewer hours have been going into steel manufacture. The problem is that steel prices have been falling faster than costs. The extent of the price erosion was spelled out by Frank W. Luerssen, chairman of Inland Steel Co.

"Since 1981, Inland's last profitable year, average price realization for the company's steel products stated in constant 1985 dollars has declined 17.5 pct," said Mr. Luerssen.

In 1985, the price slide that began in 1982 accelerated. "A 10 pct reduction in the average selling price per ton of steel more than offset substantial cost improvements in our steel operation," said Raymond Hay, chairman of LTV Corp.

LTV had a special charge of $378 million from the idling of facilities at Aliquippa. This magnified the financial problem, but the problem was real enough. LTV Steel had an operating loss of $227 million in 1985.

United States Steel Corp. had a net profit of $409 million in 1985, but this was almost entirely from the Marathon Oil subsidiary and other non-steel activities. The steel segment had an operating profit of $27 million for the full year, but an operating loss of $88 million in the fourth quarter.

"In fact," said David M. Roderick, chairman, "with the inclusion of financial and other applicable charges, this segment has been unprofitable for four years.

"Looking at the effects of lower transaction prices alone,"he added, "operating income was adversely impacted by about $300 million in 1985 compared with 1984."

U.S. Steel's 1985 results weren't calculated to discourage further diversification. On Feb. 11, stockholders approved the acquisition of Texas Oil & Gas Corp.

Bethlehem Steel Corp. reported net losses of $78 million for the fourth quarter and $196 million for all of 1985. With the help of some pension and inventory adjustments, Bethlehem lowered the operating loss of its steel operation to $3 million in the fourth quarter.

National Steel Corp. lost $27 million in the fourth quarter and $88 million in all of 1985. These results pointed up price problems because National specializes in sheet products and demand for sheet was strong in 1985. The problem was price not volume.

There was one conspicuous exception to the industry's profit pattern. Weirton Steel Corp. earned $61 million in 1985 and $12.5 million in the fourth quarter.

"Our second year as an employee-owned company was most gratifying," said Robert Loughhead, president of Weirton.

There were some heartening performances by electric furnace companies in 1985. Florida Steel Corp. had a profit of nearly $2.5 million in the December quarter. That just about doubled the 1984 margin and would have been even better had it not been for a special charge of $725,000 for environmental work.

Laclede Steel Co. continued to operate in the black. Operating at 90 pct in 1985, Laclede had a profit of more than $5.2 million.

No one was very optimistic about prospects for 1986. There had been no dramatic change, but steel shipments in the first quarter will probably be up about 500,000 tons from the first quarter of 1985.

It's possible demand will be inflated in the first half by hedge buying in anticipation of a possible strike Aug. 1. The mills were trying to ward off abnormal buying by negotiating early settlements.

The big variable in the price and volume picture was imported steel. In 1985, the Reagan Administration's restraint program failed.

(Sales and earnings table appears on p. 49; story continues on p. 51.)

STEEL: THE PRICE WAR TAKES ITS TOLL

1985 PROFIT REPORT (In Millions of Dollars)

		EARNINGS			SALES		
	1985 E/S	1985	1984	Pct Change	1985	1984	Pct Change
USS	2.1	$409.0	$493.0	–17.0	$19,283.0	$19,154.0	+0.9
LTV	—	(723.9)	(378.5)	—	8,200.0	7,460.0	+10.0
BETHLEHEM	—	(196.0)	(112.5)	—	5,117.7	5,392.1	–5.1
ARMCO	1.5	55.0	(295.0)	—	3,732.7	4,042.6	–7.7
INLAND	—	(178.4)	(41.4)	—	2,999.4	3,135.0	–4.3
NATIONAL	—	(88.4)	20.8	—	2,082.3	2,293.1	+9.2
TOTAL	—	(722.7)	(313.3)	—	41,415.1	41,426.8	—
CYCLOPS	1.9	26.2	18.4	+42.0	1,358.8	1,271.6	+6.9
WEIRTON	5.3	61.0	60.6	+0.7	1,156.3	1,075.1	+7.5
INTERLAKE	3.3	28.2	36.6	–23.0	850.2	845.1	+0.6
LUKENS	—	4.2	4.7	—	422.5	416.4	–1.5
COPPERWELD	—	(22.5)	(4.5)	—	350.2	438.5	–20.0
QUANEX	3.4	10.1	2.0	+411.0	297.0	398.8	–25.0
FLORIDA	2.7	7.7	6.7	+16.0	288.0	286.1	+0.7
CF&I	—	(3.5)	(28.2)	—	253.3	325.3	–22.0
CARPENTER	—	(0.9)	11.7	—	239.0	264.5	–9.6
LACLEDE	2.3	5.2	7.5	–30.0	223.8	231.6	+3.4

*Carpenter six months only.

FOURTH QUARTER PROFIT REPORT—1985 (In Millions of Dollars)

		EARNINGS			SALES		
	1985 E/S	4th Q 1985	4th Q 1984	Pct Change	4th Q 1985	4th Q 1984	Pct Change
USS	1.2	$57.0	$29.0	+97.0	$4,731.0	$4,659.0	+1.5
LTV	—	(75.7)	(246.7)	—	2,064.0	2,008.0	+2.8
BETHLEHEM	—	(77.5)	(64.5)	—	1,285.9	1,188.7	+8.1
ARMCO	1.2	10.4	(64.5)	—	863.9	988.2	–13.0
INLAND	—	(90.5)	(28.3)	—	716.4	723.4	–1.0
NATIONAL	—	(27.2)	1.9	—	508.3	548.3	–7.3
TOTAL	—	(203.5)	(373.1)	—	10,165.5	10,117.6	+0.5

NONFERROUS: LITTLE OR NO PROFITS

FOURTH QUARTER PROFIT REPORT—1985 (In Millions of Dollars)

	NET INCOME			SALES AND OTHER REVENUES		
	4th Q 1985	4th Q 1984	Pct Change	4th Q 1985	4th Q 1984	Pct Change
ALCAN	($212.0)	$20.0	—	$1,488.0	$1,319.0	+12.8
ALCOA	(120.9)	(14.7)	—	1,213.4	1,386.0	–12.5
ALUMAX	27.8	15.7	+77.1	455.0	497.0	–8.6
ASARCO	(24.9)	(236.3)	—	308.9	282.2	+9.5
BRUSH WELLMAN	(3.8)	9.8	—	57.5	69.7	–17.5
COMINCO	(71.6)	(5.1)	—	327.2	375.8	–12.9
CYPRUS MINERALS	(415.8)	(39.5)	—	218.7	141.2	+54.9
ECHO BAY	5.5	6.8	–19.1	30.1	24.6	+22.4
ENGELHARD	11.1	17.7	–37.3	675.3	642.3	+5.1
FALCONBRIDGE LTD.	7.6	9.0	–15.6	186.5	160.9	+15.9
FREEPORT MCMORAN	14.5	24.9	–41.8	155.1	216.3	–28.3
HECLA MINING	(3.9)	(4.2)	—	17.5	22.2	–21.2
INCO	7.6	4.5	+68.9	384.6	388.8	–1.1
INT'L ALUMINUM	3.9	5.0	–22.0	79.0	77.9	+1.4
KAISER ALUMINUM	(107.8)	3.9	—	512.5	520.8	–1.6
NEWMONT MINING	(61.5)	4.3	—	178.3	157.7	+13.1
OLIN	8.4	12.2	–31.1	390.6	431.7	–9.5
OREMET	0.6	2.8	–78.6	12.0	14.7	–18.4
PHELPS DODGE	6.6	(217.6)	—	225.4	217.6	+3.6
PINE POINT MINES	(49.0)	3.8	—	18.3	29.6	–38.2
REVERE COPPER	(8.0)	8.6	—	116.9	143.1	–18.3
REYNOLDS METALS	0.3	38.4	–99.2	806.9	839.6	–3.9
SHERRITT GORDON	(23.8)	4.4	—	99.7	105.3	–5.3
VULCAN MATERIALS	12.0	17.4	–31.0	239.0	250.4	–4.6

Alcan Aluminum, Ltd: Net loss for 1985 period includes net charge of $215 million for writedown of bauxite and alumina investments, raw material inventory writedown and some overseas investments. Also includes an $8 million extraordinary credit from tax-loss carryforward. Net for 1984 period includes $8 million extraordinary credit from tax-loss carryforward. **Aluminum Co. of America:** Net loss for 1986 period includes $144.6 million charge from plant closings and writedowns. Net loss for 1984 period includes writedowns of $53.5 million and net gains of $20.5 million from sale of a plant and $4.3 million from sale of real estate. **Asarco, Inc.:** Net loss for the 1985 period includes a $4.5 million charge related to the closing of a zinc oxide plant in Columbus, Ohio. Net loss for the 1984 period includes $216 million charge for plant closings and writedown of assets. **Brush Wellman, Inc.:** Net loss for 1985 period includes $9.8 million loss from discontinued operations. **Cominco Ltd:** Canadian funds. Net loss for 1985 period includes extraordinary charge of $36 million. **Cyprus Minerals:** Net loss for 1985 period includes $432.5 million charge from writedown of assets. Results for both periods are pro forma; company was spun off by Amoco Corp. on July 1, 1985. **Echo Bay Mines Ltd.:** Canadian funds. Results for 1985 period include company's 50 pct interest in Round Mountain gold mine. **Falconbridge Ltd:** Canadian funds. **Hecla Mining Co.:** Net loss for the 1984 period includes $1.97 million tax benefit from tax-loss carryforward. **Kaiser Aluminum & Chemical Corp.:** Net loss for 1985 period includes $1.6 million loss from disposition of discontinued operations. **Newmont Mining Corp.:** Net loss for 1985 period includes $56.7 million net charge for asset writedowns and closings and $462,000 tax benefit from tax loss carryforward. Net for 1984 period includes $3.8 million tax benefit from tax loss carryforward. **Olin Corp.:** Net for 1984 period includes $4.3 million income from discontinued operations. **Phelps Dodge Corp.:** Net for the 1985 period includes a $2.8 million tax benefit from tax loss carryforward. Net for the 1984 period includes $216 million in charges from closings of plants and writedown of assets. **Pine Point Mines Ltd.:** Canadian funds. Net loss for 1985 period includes extraordinary charge of $42.6 million. **Revere Copper & Brass Inc.:** Loss for the 1985 period includes a $4.6 million loss from sale of assets, restructurings and settlements of claims compared with $9.4 million in losses for the same 1984 period. Loss for 1985 period also includes net charge of $46,000 resulting from $1.70 million gain from settlement of liabilities and a $1.75 million charge from reversal of tax-loss carryforward. **Reynolds Metals Co.:** Net for 1985 period includes $4.6 million tax benefit from tax loss carryforward. Net for 1984 period includes $6.3 million tax benefit from tax loss carryforward. **Sherritt Gordon Mines:** Canadian funds. **Vulcan Materials Corp.:** Results include losses from discontinued operations amounting to $2.3 million in the 1985 period and $875,000 in the 1984 period.

"Imports of finished steel products last year accounted for an estimated 23.6 pct of the U.S. market, almost 30 pct above the target of 18.5 pct set by the President," said Donald H. Trautlein, chairman of Bethiehem Steel Corp.

Domestic producers are hoping for a downturn in 1986, but no new trend was seen in the latest government figures. More than 2 million tons were imported in December.

Nonferrous

For many nonferrous metals companies, 1985 was another year spent out of sync with the business recovery that started the year before. The fourth quarter was no exception and it also was a period of big writeoffs of plant and assets that swept across large portions of the aluminum and copper landscapes.

Not that the demand wasn't there. The aluminum producers' shipments were about on par with 1984, a record year consumption-wise. And copper consumption also was high. Phelps Dodge Corp., which managed to stay in the black in the fourth quarter, had an 8 pct increase in copper sales last year, but industry shipments overall were off about 5 pct despite lower imports.

The problem once again was prices. While copper prices were a bit firmer in the fourth quarter, on an annual basis, they looked like a replay of 1984.

Aluminum prices started sagging last Spring and didn't start showing signs of life until the latter weeks of the fourth quarter—too late to do much good before the books were closed on the quarter and the year.

Despite a downturn in nickel prices on the terminal market, Inco, Ltd., and Falconbridge, Ltd., managed to stay in the black. Stringent cost-cutting measures were given most of the credit.

There was a lot of fourth quarter red ink in the aluminum sector, where the write-offs were heaviest.

Alcan said two-thirds of its fourth quarter writedown related to bauxite and alumina facilities. The company's deliveries of ingot and fabricated products were up sharply in the quarter and full year and it managed to trim inventory despite the extra 100,000 tons of metal that came with the purchase of aluminum smelting and fabricating units from Atlantic Richfield Co.

Alcan said its realizations on ingot sales didn't bottom until the fourth quarter and fabricated product margins also were narrower. The Canadian company noted that hedge market prices for aluminum ingot began showing signs of improvement early in December.

Alcoa's shipments were down sharply in the fourth quarter and also were lower for the year. Charles W. Parry, chairman, said Alcoa's "restructuring program continued in 1985, with asset sales and writeoffs that will improve the company's cost structure. Stripping away the unusual items, Alcoa generated a profit of $100.3 million from ongoing operations for the year." Mr. Parry said Alcoa's capital spending program should be about $610 million this year, compared with $538 million spent last year out of an initial budget of $670 million. A lot of the emphasis will continue to be applied to rolling capacity.

David P. Reynolds, chairman of Reynolds Metals Co., said the uptrend in aluminum ingot prices early in 1986 should be followed by higher tags on fabricated products as the year progresses.

Kaiser Aluminum's fourth quarter loss of $107.8 million was after a revised after-tax charge of $119.2 million in asset writedowns.

Phelps Dodge said its primary metal segment, consisting principally of its copper-producing operations from mining through copper rod casting, recorded an $18.4 million profit from operations in the fourth quarter compared with $25.6 million in red ink during the same 1984 period.

The improvement was marked without much help from prices. The New York Commodity Exchange (Comex) price averaged 61.6¢ a lb compared with 57.8¢ a lb in the final 1984 period, but for the year as a whole, the average was 61¢ for 1985 and 61.3¢ for 1984. □

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THE WINNERS AND LOSERS
WORLD'S TOP 50 STEEL PRODUCERS
U.S. STEEL'S A TEAM

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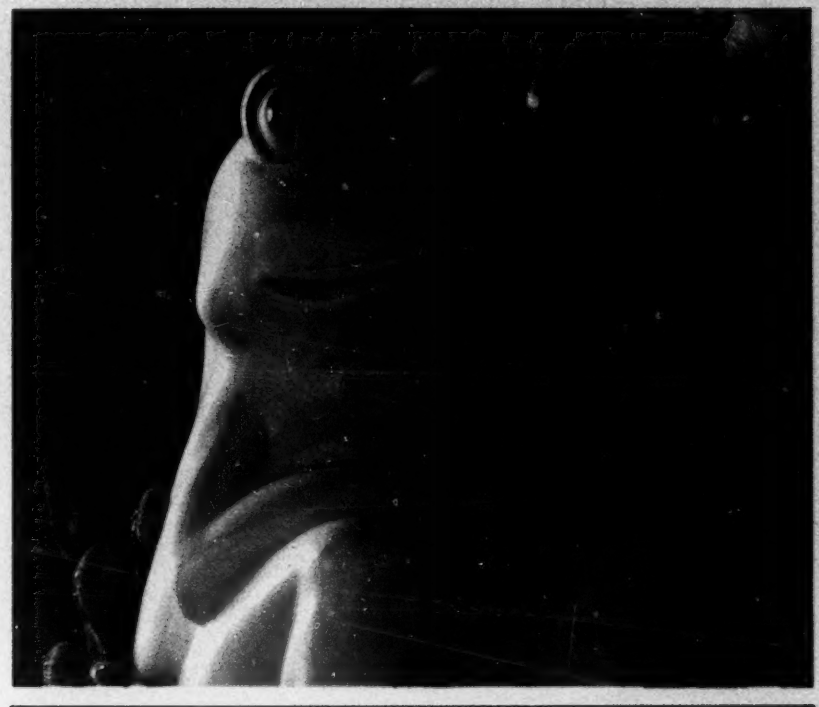

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IRON AGE'S

1985 TOP 50 WORLD STEEL PRODUCERS

In a stagnant market, producers worldwide are modernizing, reducing their work forces, and improving utilization rates.

BY JAMES B. POND

World crude steel production is up again.

Could better days be ahead?

No, not yet.

In the countries that report production figures to the International Iron and Steel Institute (IISI), crude steel production in 1985 rose only 1.4 pct over 1984, to 720 million metric tons.

To put things in perspective, last year's production of raw steel was 3.6 pct below the previous peak of 746.5 million metric tons posted in 1979, and 11.6 pct above the 1982 trough, at 645.2 million metric tons.

According to the IISI, U.S. production fell 4.2 pct, on an annual basis, compared with 1984. Japanese production was off 0.3 pct; the European Community rose 0.3 pct; while those in other areas, not including production figures from the East Bloc nations or China, rose 4.9 pct.

Outside the the Western World, results were mixed during 1985. The Soviet Union and other Eastern Europe COMECON members increased production 0.5 pct, to 1.2 million metric tons. The Peoples Republic of China and Democratic Peoples Republic of Korea (N. Korea), showed a 10.0 pct gain compared to 1984, and a 37.3 pct gain compared with 1979, the IISI reported.

While many see world steel production as being limited by stagnating demand, others view the period as an opportunity for stabilization. In either case, some tough decisions were made at the end of 1984 by the management of steel producing firms and their governments. Overcapacity continued to be a millstone.

Iron Age's annual survey of the TOP 50 World Steel Producers revealed some interesting changes taking place within the industry worldwide. In the Top 10 of the TOP 50 producers in 1985, Japanese and European firms were mentioned three times each and U.S. firms twice.

Utilization Rate

In 1985, managers focused on increasing their firm's utilization rate. For the second year in a row two firms, China Steel Corp. (Taiwan) and South Korea's Pohang Iron & Steel Co., Ltd. (Posco) exceeded capacity and ran flat out all year. In 1984, Posco, with its greater capacity, was the leader but for 1985 China Steel showed the best utilization rate of the TOP 50, with an amazing 103 pct utilization rate.

The Top 10 producers listed in this category reported rates of 90 pct or better. Of the ten, half were also in this Top 10 listing for 1984. In addition to China Steel and Posco, Siderbrás moved from ninth to fourth position; Svenskt Stål (SSAB), from sixth to fifth; and Broken Hill Proprietary (BHP) fell from seventh position to ninth in 1985. Only National Steel Corp. of the U.S. firms reported a utilization rate of 90 pct or better. In 1984, no U.S. producers made this group.

Based on the rate of improvement during the year (Top 10 Steel Producers That Improved Production in 1985 based on straight improvement in raw steel production), three of the top 10 producers were from the U.S. in 1984 and in 1985. Japan joined this group in 1985.

Unfortunately, with the exception of LTV Steel with its 31.2 pct gain, the group as a whole fared less favorably than did the group in 1984 versus 1983. Most gains were under 16 pct, denoting a downturn in the steel markets worldwide. Another interesting sidelight, only two firms were on the comparable 1984 listing. This indicated that there are a lot of steel producers worldwide that are trying to improve their productivity as well as production.

What Is A Fair Measure?

Who are the Top 10 of the TOP 50 based on tons produced per employee? Admittedly, this is not the truest measure nor the fairest of efficiency. It would be best to compare output on a cost-per-ton basis but this comparison would be equally nebulous due to changing exchange rates and widely varying accounting procedures.

In order to achieve more uniformity in answering the question, "How Many Employees Do You Have (engaged in steelmaking operations)?" we included a copy of the 1984 results of the TOP 50 World Steel Producers as reported by *Iron Age*. With this in mind, there is validity in comparing tons produced per employee as a measure of efficiency. Look at the winners. Once again, Tokyo Steel won top spot, with 1,485 tons per employee.

Much to the surprise of many, U.S. producers showed some remarkable gains during 1985. Nucor Corp., which moved from third to second, reported 981 tons per employee, and North Star Steel Co.,

(The table listing the TOP 50 steel producers begins on P. 48B3; the story continues on p. 48B7.)

World's Top 50 Steel Producers in 1985

1985 Rank	(1984 Rank)	Company (Country)	Year	Crude Steel Production (metric tons)	Maximum Capability (metric tons)	Exports As % of Shipments	No. of Employees (Steelmaking)	Tons per Employee	Capital Expenditures 1986 Foracast 1985 Actual (Millions)
1	(1)	Nippon Steel (Japan)	1985 1984	26,561,000 29,420,000	49,559,000 52,973,000	34.0 34.0	63,000 64,000	453 460	Yen 150K F1 Yen 175K F1
2	(2)	U. S. Steel (U.S.A.)	1985 1984	15,144,000 13,680,000	23,800,000 23,800,000	1.0 1.0	31,597 44,559	479 307	N.A. $1,184
3	(3)	Finsider (Italy)	1985 1984	13,453,689 13,517,476	21,445,000 21,445,000	32.4 31.3	76,218 81,608	177 166	L 956.2K L 858.8K
4	(7)	SIDERBRÁS[1] (Brazil)	1985 1984	13,230,700 11,389,000	13,300,000 12,577,000	39.2 35.3	47,794[2] 46,403[3]	277 245	$1,882 $1,381
5	(4)	British Steel (England)	1985 1984	13,000,000 13,400,000	21,400,000 21,400,000	28.4 27.9	60,930 65,450	213 205	£176 F1 £182 F1
6	(16)	SACILOR (France)	1985 1984	12,319,000 12,485,000	16,870,000 19,090,000	49.5 50.0	64,000 73,700	193 169	FF 2.3 FF 2.8
7	(80	Sumitomo Metals (Japan)	1985 1984	12,122,840 11,302,602	21,512,000 21,512,000	39.7 40.0	27,337 27,748	444 407	Yen 100K F1 Yen 90K F1
8	(5)	NKK(Nippon Kokan) (Japan)	1985 1984	12,100,000 12,500,000	21,000,000 21,000,000	N.A. 33.6	21,500 21,900	563 571	Yen 116K Yen 116K
9	(13)	LTV (U.S.A.)	1985 1984	11,900,000 9,070,000	19,900,000 23,400,000	N.A. N.A.	29,802 35,352	399 257	N.A. N.A.
10	(6)	Thyssen Stahl (W. Germany)	1985 1984	11,065,000 10,848,000	11,800,000 13,900,000	40 39	35,404 36,706	313 296	DM740K DM668K
11	(9)	Kawasaki Steel (Japan)	1985 1984	10,856,000 11,283,000	20,780,000 20,780,000	34.1 36.0	25,713 26,976	422 418	Yen 90K F1 Yen 93K F1
12	(10)	Bethlehem Steel (U.S.A.)	1985 1984	9,471,049 11,037,176	15,975,528 16,329,330	1.0 1.0	28,776 33,927	329 325	$290 $322.2
13	(12)	POSCO (S. Korea)	1985 1984	9,260,000 9,194,552	N.A. 9,100,000	N.A. 30.0	N.A. 14,957	N.A. 615	N.A. $699
14	(11)	USINOR (France)	1985 1984	7,000,000 9,400,000	8,000,000 13,000,000	49.0 42.0	23,000 40,000	304 325	F 200 F 800
15	(15)	SAIL (India)	1985 1984	6,815,000 6,300,000	9,400,000 9,400,000	0.3 3.0	148,631 144,844	46 44	Rupees 472.2 Rupees 570.4
16	(19)	ISCOR (S. Africa)	1985 1984	6,810,300 5,770,300	7,300,000 7,300,000	N.A. 34.0	N.A. 39,700	N.A. 145	N.A. F3 R170 F3
17	(14)	Kobe Steel (Japan)	1985 1984	6,465,000 6,618,000	8,775,000 8,814,000	30.0 31.0	12,445 12,711	520 521	Yen 62K F1 Yen 43K F1
18	(17)	Broken Hill Pty (Australia)	1985 1984	6,322,644 6,110,613	6,800,000 6,800,000	24.9 20.1	28,962 30,399	218 201	A$407 F4 A$155 F4
19	(18)	Inland Steel (U.S.A.)	1985 1984	6,069,000 6,479,000	9,300,000 9,300,000	0 0	24,413 26,921	249 241	$25 $21.7
20	(21)	Hoogovens Groep (Netherlands	1985 1984	5,302,000 5,532,000	7,200,000 7,200,000	70.8 69.8	17,687 17,607	300 314	DFL788 DFL835
21	(20)	Armco (U.S.A.)	1985 1984	5,000,000 5,600,000	7,000,000 8,000,000	1.0 1.0	17,800 19,400	281 289	$80 $68
22	(27)	Klöckner-Werke (W. Germany)	1985 1984	4,593,000 4,270,000	N.A. N.A.	N.A. N.A.	20,647 20,280	222 211	N.A. F2 N.A. F2
23	(24)	STELCO (Canada)	1985 1984	4,527,832 4,667,783	7,294,050 7,259,550	20.6 22.1	18,773 20,612	241 227	N.A. C$132.1
24	(28)	ENSIDESA (Spain)	1985 1984	4,481,905 4,108,600	4,700,000 4,700,000	41.0 35.0	19,765 21,012	227 196	Pts 59,130 Pts 25,029
25	(22)	Cockerill Sambre (Belgium)	1985 1984	4,451,000 4,835,000	6,600,000 7,500,000	67.0 66.0[4]	17,008 19,334	262 250	N.A. N.A.
26	(32)	Mannesmann[5] (W. Germany)	1985 1984	4,413,000 3,968,000	N.A. N.A.	N.A. N.A.	N.A. N.A.	N.A. N.A.	N.A. N.A.
27	(31)	DOFASCO (Canada)	1985 1984	4,372,700 4,468,000	N.A. N.A.	N.A. N.A.	12,000 11,700	364 382	C$N.A. C$195[6]
28	(23)	National Steel (U.S.A.)	1985 1984	4,341,300 4,365,500	4,822,700 4,822,700	0 0	12,500 12,500	347 349	$251 $262
29	(30)	Voest-Alpine (Austria)	1985 1984	4,267,887 4,444,651	N.A. N.A.	64.0 65.0	15,800 16,200	270 274	öS 1,500 öS 1,700

World's Top 50 Steel Producers in 1985

1985 Rank	(1984 Rank)	Company (Country)	Year	Crude Steel Production (metric tons)	Maximum Capability (metric tons)	Exports As % of Shipments	No. of Employees (Steelmaking)	Tons per Employee	Capital Expenditures 1986 Forecast 1985 Actual (Millions)
30	(25)	Krupp Stahl (W. Germany)	1985	4,202,000	N.A.	30.0	21,545	195	N.A.
			1984	4,395,000	N.A.	30.0	22,362	197	N.A.
31	(26)	Sidermex (Mexico)	1985	4,160,000	N.A.	N.A.	N.A.	N.A.	N.A.
			1984	4,317,000	5,690,000	16.0	39,087	111	$109K
32	(29)	Hoesch Stahl (W. Germany)	1985	4,139,000	4,889,000	28.9	17,600	235	DM215
			1984	4,109,000	4,889,000	29.5	17,800	231	DM712
33	(33)	Arbed S.A. (Luxembourg)	1985	3,945,275	4,600,000	96.0	12,830	308	FLux 2,573
			1984	3,987,440	4,600,000	96.0	12,690	314	FLux 2,527
34	(34)	Peine-Salzgitter (W. Germany)	1985	3,816,000	5,250,000	N.A.	10,955	348	N.A.
			1984	3,628,000	5,250,000	N.A.	11,829	307	N.A.
35	(36)	China Steel (Taiwan)	1985	3,346,878	3,250,000	28.0	7,495	447	NT$ 19,399
			1984	3,340,572	3,250,000	27.9	7,486	446	NT$ 6,295
36	(37)	Nisshin Steel (Japan)	1985	3,291,000	5,473,000	20.3	8,716	378	Y 31,300K F1
			1984	2,965,000	5,473,000	24.3	8,762	338	Yen 30,500K F1
37	(35)	Sidmar N.V. (Belgium)	1985	3,128,178	3,500,000	94.0	6,627	472	BF 6K
			1984	3,355,815	3,500,000	91.0	6,411	523	BF 5.6K
38	(40)	Svenskt Stål (Sweden)	1985	3,010,000	3,100,000	45.0	11,230	268	SEK570
			1984	2,851,000	3,100,000	41.0	11,500	248	SEK550
39	(39)	Tokyo Steel (Japan)	1985	2,784,854	3,720,000	31.0	1,875	1,485	Yen 3,000
			1984	2,896,179	3,720,000	24.0	1,974	1,467	Yen 4,300
40	(42)	SIDOR (Venezuela)	1985	2,737,000	4,800,000	46.0	16,751	163	B 1,156
			1984	2,511,000	4,800,000	32.0	15,566	161	B 233
41	(43)	Arbed Saarstahl (W. Germany)	1985	2,679,000	3,700,000	35.0	13,254	202	DM 120
			1984	2,462,000	3,700,000	40.0	14,427	171	DM 72
42	(38)	COSIPA (Brazil)	1985	2,640,186	3,160,000	27.0	14,500	182	$272
			1984	2,915,634	3,160,000	37.0	14,389	203	$125
43	(44)	Weirton Steel (U.S.A.)	1985	2,489,427	3,876,000	0.8	7,865	317	$98.5
			1984	2,535,916	3,876,000	0.6	7,699	329	$47.5
44	(45)	Algoma Steel (Canada)	1985	2,488,000	N.A.	N.A.	10,000	249	N.A.
			1984	2,294,000	N.A.	N.A.	9,000	255	C$143.2
45	(46)	Tata Iron & Steel (India)	1985	2,053,000	2,160,000	N.A.	29,200	70	Rs. 2,730 F1
			1984	2,060,000	2,160,000	N.A.	29,400	70	Rs. 1,310
46	(48)	Nucor Corp. (U.S.A.)	1985	1,717,000	2,100,000	>1.0	1,750	981	$60
			1984	1,565,000	2,100,000	>1.0	1,780	879	$29
47	(49)	Daido Steel (Japan)	1985	1,623,000	1,923,000	12.2	5,500	295	Yen 150,000 F3
			1984	1,683,000	1,871,000	12.7	5,600	301	Yen 175,000 F3
48	(47)	Rautaruukki Oy (Finland)	1985	1,608,000	1,900,000	48.0	4,393	366	FMK 900
			1984	1,773,000	1,900,000	46.0	4,478	396	FMK 695
49	(41)	Wheeling-Pittsburgh (U.S.A.)	1985	1,600,600	4,000,000	0.01	8,200	195	N.A.
			1984	2,550,000	4,000,000	0.01	10,700	238	N.A.
50	(N)	North Star Steel (U.S.A.)	1985	1,454,791	2,160,000	<1.0	1,554	936	N.A.
			1984	1,730,970	1,800,000	<1.0	1,708	1,013	N.A.

FOOTNOTES

(N) New listing
K Thousand (Thousand million = Billion)
F1 Fiscal Year April 1—March 31
F2 Fiscal Year October 1—September 30
F3 Fiscal Year July 1—June 30
F4 June 1—May 31
[1] Sidebrás System, including USIMINAS and CSN
[2] Includes ACOMINAS
[3] Excludes ACOMINAS
[4] Exported 52 pct to EEC and 22 pct to others
[5] Production primarily for internal use
[6] Current program extends to late '80s

Company Names Behind The Acronyms

COSIPA — Companhia Siderúrgica Paulista
DOFASCO — Dominion Foundries & Steel Ltd.
ENSIDESA — Empresa Nacional Siderúrgica, S.A.
ISCOR — S. African Iron & Steel Industrial Corp., Ltd.
POSCO — Pohang Iron and Steel Company Ltd
SACILOR — Aciéries et Laminoirs de Lorraine
SAIL — Steel Authority of India, Ltd.
SIDERBRÁS — Siderurgia Brasileira S.A.
SIDOR — C.V.G. Siderurgica del Orinoco C.A.
STELCO — The Steel Company of Canada, Ltd.
USINOR — Union Sidérurgique du Nord et de l'Est de la France

which was not listed last year and ranked 50th in 1985, took over the third position with 936 tons per employee. Posco, of S. Korea, held fourth ranking both years, with an estimated 615 tons per employee.

Of the Top 10 firms in this category, all but three were included in the 1984 listings.

A Disappointing Performance

The "Best Productivity Improvement in 1985 Compared with 1984 (based on tons of raw steel produced per employee)," shows that only two of the ten, U.S. Steel Corp. and Nisshin Steel Co., Ltd., were in the 1984 rankings. This shows persistence. But, the 1984 rankings included seven firms that improved productivity by more than 17 pct. In 1985, only three of the Top 10 firms ranked did better than 17 pct. Seven did not do anything extraordinary. Only two, U.S. Steel and LTV, reported big gains.

The relative low scores in this category reflects upon the industry as a whole worldwide. Many steel producers did better, but not significantly better, than they did in the previous year.

The real plight of the steel producers worldwide is revealed in the category, "The Least Fortunate Producers (based on lowest utilization rate)." This listing shows ten firms that experienced a utilization rate of 60 pct and worse. Eight of these producers were on this list for the second year in a row. Mind you, these are world leaders—the best in the industry. Obviously the problem is one of overcapacity, the result of dynamic optimism years ago and from faulty forecasts on the part of industry specialists who predicted a world demand for steel that never materialized.

The poor showing of Wheeling-Pittsburgh Steel Corp. reflects the damaging effects of a 90 day strike.

In this category, how did the various steel producing areas fare? Of the ten, five were Japanese producers, three were U.S., one is European, and one is South American.

Is anyone doing anything about the plight of the steel industry

The Most Fortunate Producers Based on Highest Utilization Rate

1985 Ranking	TOP 50 Ranking	Company	Capacity	Production	Rate
1	(35)	China Steel	3.3	3.2	103.0
2	(13)	POSCO	9.3	9.1	101.8
3	(3)	Finsider	13.4	13.5	99.5
4	(4)	Siderbrás	13.2	13.3	99.5
5	(38)	SSAB	3.0	3.1	97.1
6	(24)	ENSIDESA	4.5	4.7	95.4
7	(45)	Tata Iron & Steel	2.0	2.2	95.0
8	(10)	Thyssen Stahl	11.1	11.8	93.8
9	(18)	BHP	6.1	6.6	92.6
10	(28)	National Steel	4.3	4.8	90.0

Steel Producers That Improved Production in 1985

Based on raw steel production by tonnage

1985 Ranking	TOP 50 Ranking	Company	1984-1985 (million tons)	Pct Change
1	(9)	LTV	9.1 —11.9	31.2
2	(16)	ISCOR	5.8 — 6.8	18.0
3	(4)	Siderbrás	11.4 —13.2	16.0
4	(36)	Nisshin Steel	3.0 — 3.3	11.0
5	(2)	U.S. Steel	13.7 —15.1	10.7
6	(26)	Mannesmann	4.0 — 4.4	10.6
7	(46)	Nucor Steel	1.6 — 1.7	9.7
8	(24)	ENSIDESA	4.1 — 4.5	9.1
9	(40)	SIDOR	2.5 — 2.7	9.0
10	(44)	Algoma Steel	2.3 — 2.5	8.5

1985 Top Ten Producers

Based on Tons Produced Per Employee

1985 Ranking	TOP 50 Ranking	Company	1984	1985
1	(39)	Tokyo Steel	1,467	1,485
2	(46)	Nucor Corp.	879	981
3	(50)	North Star Steel	1,013	936
4	(13)	POSCO	615	615
5	(8)	NKK	571	563
6	(17)	Kobe Steel	571	520
7	(2)	U.S. Steel	307	479
8	(37)	Sidmar N.V.	523	472
9	(1)	Nippon Steel	460	453
10	(35)	China Steel	446	447

Best Productivity Improvement 1985 Versus 1984 (Tons/Employee)

1985 Ranking	TOP 50 Ranking	Company	Tons/Employee 1984—1985	Pct
1	(2)	U.S. Steel	307 — 479	56.1
2	(9)	LTV	257 — 399	55.6
3	(41)	Arbed Saarstahl	171 — 202	18.5
4	(6)	SACILOR	169 — 193	13.6
5	(34)	Peine-Salzgitter	307 — 348	13.6
6	(4)	Siderbrás	245 — 277	12.9
7	(46)	Nucor Corp	879 — 981	11.6
8	(36)	Nisshin Steel	338 — 378	11.6
9	(7)	Sumitomo	407 — 444	8.9
10	(38)	Svenskt Stål	248 — 268	8.1

The Least Fortunate Producers Based on Lowest Utilization Rate

1985 Ranking	TOP 50 Ranking	Company	Capacity	Production	Rate
1	(49)	Wheeling-Pittsburgh	1.6	4.0	40.0
2	(11)	Kawasaki	10.9	20.8	52.2
3	(7)	Sumitomo Metals	12.1	21.5	56.4
4	(40)	SIDOR	2.7	4.8	57.0
5	(1)	Nippon Steel	28.6	49.6	57.6
6	(8)	NKK	12.1	21.0	57.6
7	(12)	Bethlehem	9.5	16.0	59.3
8	(9)	LTV	11.9	19.9	59.8
9	(36)	Nisshin Steel	3.3	5.5	60.1
10	(5)	British Steel	13.0	21.4	60.7

Firms That Shrank in 1985 By Decreasing Employment

1985 Ranking	TOP 50 Ranking	Company	1984—1985	Pct Change
1	(2)	U.S. Steel	44,559—31,597	29.1
2	(49)	Wheeling-Pittsburgh	10,700— 8,200	23.4
3	(9)	LTV	35,352—29,802	15.9
4	(6)	SACILOR	73,700—64,000	13.2
5	(25)	Cockerill Sambre	19,334—17,008	12.0
6	(19)	Inland Steel	26,921—24,413	9.3
7	(50)	North Star	1,708— 1,554	9.0
8	(23)	STELCO	20,612—18,773	8.9
9	(21)	Armco	19,400—17,800	8.2
10	(41)	Arbed Saarstahl	14,427—13,254	8.1

worldwide? In one category, at least, the answer is "Yes!" That category is "Firms That Shrank In 1985 By Decreasing Employment." Whether for increased efficiency or a reduction in capacity, the rankings show that of the ten producers, only three were listed in 1984 and 1985. Six firms were U.S., three were European, and one Canadian firm. Worth noting, U.S. producers reported the largest reduction in work force.

Exports, A Key To Profits

If one goes by the admonition that everyone should export, then "Exports As A Pct of Shipments" takes on some interesting interpretations. Why don't U.S. producers try to increase exports? Why did they not place more emphasis on exports following World War II?

They did not and less-developed nations, which did not have the funds to buy steel but could borrow to build steel plants, made export of U.S.-produced steel unnecessary.

Analysis of the listings indicates that seven of the TOP 50 steel producers, all European, now export more than half of their output. Two of these firms, Arbed S.A. and Sidmar N.V., export 96 pct and 94 pct respectively.

While there were some increases and decreases in exports-as-a-pct-of-shipments among those who export significant amounts, in general the status quo prevailed and changes were relatively small.

However, among those producers that experienced significant changes in export ratios, four reported declines and seven reported increases during 1985 over 1984.

Despite press reports to the contrary, U.S. steel producers seem to be taking advantage of protectionism sanctioned by the U.S. government. They are modernizing and retrenching to strengthen their positions. Positive results are evident in the *Iron Age* annual survey.

Japanese producers may be the most vulnerable to changing market conditions and competition. They have a tremendous amount of unused capacity amid a shrinking demand for steel. □

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IRON AGE
JUNE 6, 1986
METALS PRODUCER

CONTINUOUS CASTING

a new generation debuts, an older one finds new life

UNRAVELING THE MYSTERIES OF SHEET STEELS

NORTH STAR STEEL:
SHINING BRIGHTLY IN THE GLOOM

FIRST QUARTER STEEL/NONFERROUS EARNINGS

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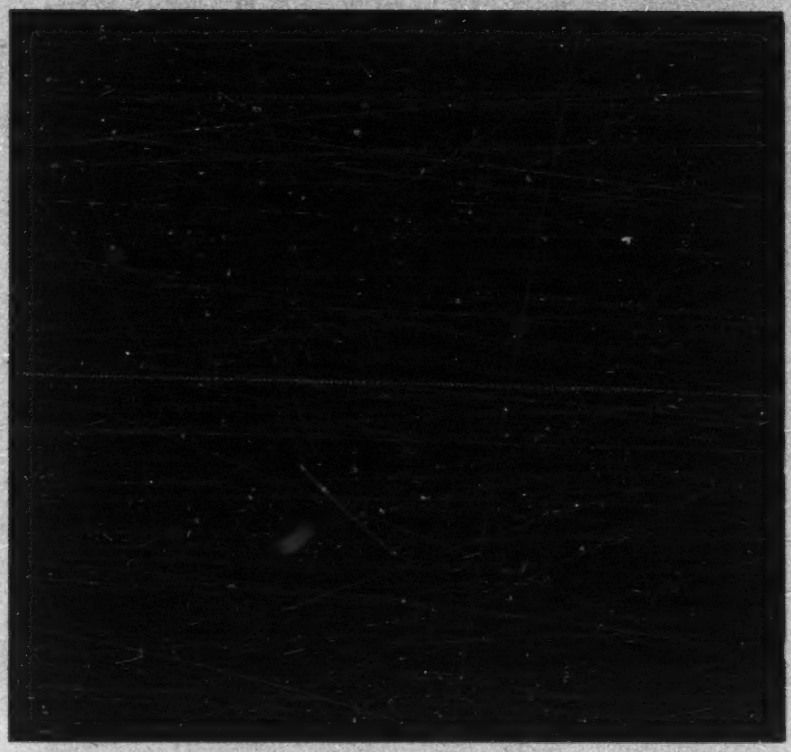

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1ST QUARTER EARNINGS

ANOTHER QUARTER OF RED INK

BY GEORGE J. MCMANUS AND ROBERT REGAN

Despite higher prices for steel, all six of the largest domestic producers lost money in the first quarter. Lower prices hold first quarter results of leading nonferrous metals companies in check.

Steel

In the first quarter of 1986, steel companies proved again they need the wage concessions being sought from the United Steelworkers of America.

All six of the largest mills lost money in the quarter. Steel prices improved a little but were still below the level needed for profitability.

The industry's financial plight drew a response from the Steelworkers. Labor costs were lowered in contracts negotiated by LTV Steel and National Steel Corp. Neither contract was ratified until the second quarter so it will be another three months before any effects are visible.

The effects of past concessions showed up in the earnings of two carbon sheet producers. Wheeling-Pittsburgh Steel Corp., which secured a $3 an hour cost reduction last year, earned $4 million in the first quarter.

Weirton Steel Corp., which reduced the pay of its owner-workers several years ago, continued to make money. Weirton's profit of $8.9 million came to 3.1 pct of sales.

There will presumably be labor cost reductions at United States Steel Corp. and the other large companies. Weirton's experience suggests the cuts could restore profitability.

However, it looks as though demand will lag again in the third quarter. If the price situation worsens, steel companies could wind up passing along their labor savings on to customers.

The extent of price cutting shows up fairly neatly in a comparison of shipments and sales. Steel shipments were up about 500,000 tons or 3 pct in the first quarter. Sales in dollars of the largest mills were down 7 pct. That works out to a 10 pct price reduction.

In the third quarter, steel companies may find out if there is a bottom to the price pit.

The biggest profit swing in the first quarter was at U.S. Steel. From earnings of $185 million in the first quarter of 1985, U.S. Steel went to a loss of $246 million in the 1986 quarter.

This change was marked by a switch in the profit mix. U.S. Steel has often complained that the profit problems of its steel operation were obscured by the profits of the oil division.

In 1986, the collapse of oil prices caused the company to devalue its petroleum inventories by $351 million. Buried under the oil losses was an operating profit of $8 million by the steel segment. This was better than a loss, but it was certainly nothing to shout about.

The problem, said U.S. Steel officials, was that while steel prices moved up 1 pct in the first quarter, they were still 10 pct below the first quarter of 1985.

"The lower transaction prices compared with the first quarter of last year reduced sales by nearly $140 million in the current year's first quarter," said David M. Roderick, chairman.

"Foreign steel imports continue to aggravate an already highly competitive domestic steel market," he added.

Mr. Roderick saw signs that the import restraint program was starting to work, but hard evidence of this was lacking. The 5.7 million tons imported in the first quarter came to nearly 24 pct of domestic supply.

Bethlehem Steel Corp. lost nearly $92 million in the first quarter. The operating loss of $36 million on steel was down a little from 1985, but there was a $14 million pension credit in 1986.

With Walter W. Williams as president and chief executive, Bethlehem is concentrating on the steel business. Mr. Williams doesn't see that the company has much choice because Bethlehem's "current financial condition precludes diversification away from steel in the foreseeable future."

Inland Steel Co., which lost $26 million in the first quarter, seems to be moving in the opposite direction. On April 28, it was announced that a holding company, Inland Steel Industries, Inc., was being created. This action doesn't mean "de-emphasis in our commitment to steel," said Frank W. Luerssen, chairman.

However, one purpose of the holding company is "to enter new businesses or to undertake joint ventures without encumbrances from existing businesses."

Until recently, Inland, like Bethlehem, had devoted itself almost entirely to the steel business.

Armco Inc. had a net loss of $62.9 million, but a large chunk of this came from a special charge of fabricating operations. Armco's specialty steel division was profitable and there was only a small operating loss on carbon steel.

(Sales and earnings table appears on p. 50B2; story continues on p. 50B3.)

STEEL: A LACKLUSTER FIRST QUARTER

FIRST-QUARTER PROFIT REPORT—1986 (In Millions of Dollars)

		EARNINGS			SALES		
	1985 E/S	1st Q 1986	1st Q 1985	Pct Change	1st Q 1986	1st Q 1985	Pct Change
USS	—	($249.0)	$185.0	—	$4,651.0	$4,984.0	–6.7
LTV	—	(109.1)	(156.4)	—	1,800.9	1,995.1	–9.7
BETHLEHEM	—	(91.8)	(62.1)	—	1,168.6	1,214.0	–3.7
ARMCO	—	(62.9	(22.5)	—	819.1	919.5	–11.0
INLAND	—	(26.4)	(6.3)	—	754.1	777.9	–3.1
NATIONAL	—	(39.4)	(39.8)	—	472.5	514.0	–8.1
TOTAL	—	(578.6)	(102.1)	—	9,666.2	10,404.5	–7.1
CYCLOPS	1.8	6.1	3.2	+93.0	337.5	320.5	+5.3
WEIRTON	3.1	8.9	10.2	–13.0	287.0	295.6	–2.9
INTERLAKE	3.3	7.6	7.0	+8.0	232.9	212.4	+9.6
WHEEL-PGH.	1.8	4.0	(25.8)	—	219.6	241.0	–9.0
NUCOR	6.4	12.0	10.2	+18.1	189.0	169.0	+12.0
CARPENTER	2.9	4.1	10.3	–60.0	141.7	147.8	–4.1
LUKENS	0.4	0.5	(0.4)	—	92.9	100.5	–7.6
COPPERWELD	—	(0.6)	(0.6)	—	85.4	97.7	–13.0
QUANEX	—	(5.1)	2.4	—	82.1	68.0	+21.0
FLORIDA	2.0	1.4	1.4	–2.1	71.8	69.1	+3.9
LACLEDE	0.4	0.3	1.5	–83.0	57.8	59.1	–2.1

( ) Indicates a loss

NONFERROUS: NOTHING TO WRITE HOME ABOUT

FIRST QUARTER PROFIT REPORT—1986 (In Millions of Dollars)

	EARNINGS			SALES		
	1st Q 1986	1st Q 1985	Pct Change	1st Q 1986	1st Q 1985	Pct Change
ALCAN	$27.0	$30.0	–10.0	$1,453.0	$1,408.0	+ 3.2
ALCOA	1.4	6.7	–79.1	1,177.3	1,313.9	–10.4
ALUMAX	19.3	10.1	+91.1	476.0	450.0	+5.8
AMAX	53.4	(35.2)	—	340.5	498.1	–31.6
ASARCO	(29.2)	(14.1)	—	291.6	260.7	+11.9
BRUSH WELLMAN	4.6	9.7	–52.6	56.0	68.5	–18.2
COMINCO	14.1	(0.6)	—	288.2	337.8	–14.7
CYPRUS MINERALS	13.0	(20.9)	—	191.1	145.8	+31.1
FALCONBRIDGE LTD.	25.0	12.2	+104.9	292.4	216.3	+35.2
FREEPORT MCMORAN	(133.2)	25.7	—	159.9	214.6	–25.5
INCO	(3.5)	12.1	—	375.0	384.0	–2.3
KAISER ALUMINUM	7.2	(25.5)	—	530.7	472.0	+12.4
NEWMONT MINING	8.6	3.1	+177.4	194.6	170.6	+14.1
NORANDA	21.4	(9.9)	—	875.4	874.4	—
OLIN	25.3	15.6	+62.2	451.4	472.7	–4.5
PHELPS DODGE	15.2	2.7	+463.0	230.9	223.6	+3.3
REYNOLDS METALS	14.3	7.0	+104.3	836.3	811.4	+3.1
SHERRITT GORDON	(2.4)	1.8	—	97.8	117.3	–16.6
VULCAN MATERIALS	6.9	6.0	+38.0	200.6	216.3	–7.3

( ) Indicates a loss

Alumax Inc.: Net for the 1986 quarter included $8 million in gains from pension plan settlements, principally involving termination of pension plans of two subsidiaries. **Amax Inc.:** Net for the 1986 quarter includes $80.1 million credit for cumulative effect of an accounting change on prior periods relating to recovery of excess assets in the company's pension plan for salaried employees. Loss from continuing operations was $26.7 million in the 1986 period and $43.0 million in the 1985 period. **Asarco, Inc.:** Loss for the 1986 period includes $9 million gain on exchange of securities and $3 million gain related to reduction of interest in a joint venture. Results for the 1985 period are restated to reflect change in method of accounting for certain pension costs. **Brush Wellman Inc.:** Results for the 1985 period are restated to reflect discontinued operations. **Cominco Ltd.:** Canadian funds. Net income includes extraordinary credit of $41.4 million in the 1986 period and $9.4 million in the 1985 period. Operating losses were $27.3 million vs $600,000. **Cyprus Minerals Co.:** Results for the 1985 period are stated on pro forma basis. **Falconbridge, Ltd.:** Canadian funds. Net for the 1986 period includes $42 million gain from sale of stock. **Freeport-McMoran, Inc.:** Net loss of 1986 period includes $149 million net writedown of oil and gas assets. **Kaiser Aluminum & Chemical Corp.:** Net for the 1986 quarter includes a pre-tax gain of $32.5 million from cancellation of a long term gas supply contract. **Newmont Mining Corp.:** Results include extraordinary credits of $922,000 in the 1986 period and $430,000 in the 1985 period from tax-loss carryforwards. Net for the 1985 period included $701,000 loss from discontinued operations. **Noranda Inc.:** Canadian funds. Net for the 1986 period includes $25.6 million gain on sale of investments. **Phelps Dodge Corp.:** Net for the 1986 period includes $6.2 million extraordinary credit from tax-loss carryforwards. **Reynolds Metals Co.:** Net for the 1986 period includes $4.2 million tax benefit from tax-loss carryforwards. Net for the 1985 period includes net gain of $2.5 million from settlement of litigation. **Sherritt Gordon:** Canadian funds.

National Steel Corp. had a net loss of $39.4 million. National expects to benefit in May and June from a labor cost reduction of $1.51 under the new contract.

The 40-month contract of LTV Corp. will reduce cash costs by $3.60 an hour and increase the company's cash flow by $125 million a year. After losing another $109 million in the first quarter, LTV is obviously in need of a cost reduction.

The electric furnace producers of carbon steel were generally profitable in the first quarter. Nucor Corp., Florida Steel Corp., and Laclede Steel Co. all made money with Nucor leading the parade.

Cyclops Corp., Interlake, Inc., and Lukens, Inc., were profitable.

Nonferrous

Low prices for base metals held first quarter results of leading nonferrous metals companies in check.

There was no discernible trend in sales volume. And in cases where net income was up, the reasons were varied. These ranged from a net gain on cancellation of an energy contract through recovery of excess assets in pension funds to profits on sales of securities or investments.

There was some improvement in base aluminum and copper prices during the initial 1986 period, but the difference with depressed levels of the corresponding 1985 quarter was nothing to write home about.

Nickel prices, on the other hand, were weaker—particularly on the hedge markets—and there was no real price recovery in molybdenum, silver, lead, zinc and other base metals.

Phelps Dodge Corp. credited a jump in first quarter profits by its primary metal operations to $20.6 million from $10.9 million to lower unit production costs and better copper prices. The company's sales of mined copper were up nearly 10 pct to 96,900 tons.

Phelps Dodge executives said they had $75.2 million in cash and short term investments at the end of the quarter, compared with $29 million a year earlier.

The company received $75 million during the 1986 period from the sale of a 15 pct interest in its Morenci, Ariz., copper mining complex to Japanese interests. The company also repaid the balance of $30 million of bank debt under revolving credit agreements during the quarter. Its indebtedness under revolving credit agreements was $140 million a year earlier.

Asarco, Inc., reported that a substantial portion of its $29 million loss reflected equity accounting for results of associated companies—specifically foreign currency translation losses due to the weakening U.S. dollar.

The company noted that foreign currency accounting adjustments represent neither gains nor losses and do not affect the underlying financial position.

Asarco officials said of its four major metals, only copper showed any price improvement, with lead and silver prices down marginally and zinc down about 26 pct.

Newmont Mining Corp.'s U.S. and Canadian nonferrous metals operations were in the red. Company spokesmen blamed continued low copper prices. The impact was countered by a strong showing by the company's two gold interests, which benefited from doubled production and better gold prices.

Aluminum Co. of America, which squeaked out a $1.4 million profit in the first quarter, stated that it is "moving through a transition period from declining prices to an environment of firmer prices."

The company noted that prices on new orders for many fabricated items were up 5 pct since the start of the year, an important exception being can stock. Alcoa made commitments toward the end of the year at prices below fourth quarter 1985 levels. These price commitments, made for competitive reasons, were extended to mid-year, Alcoa said. □

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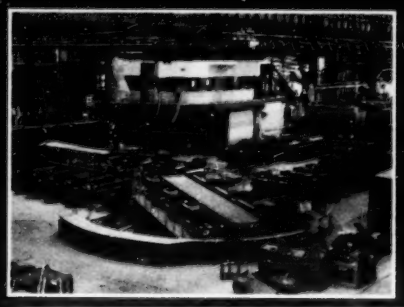

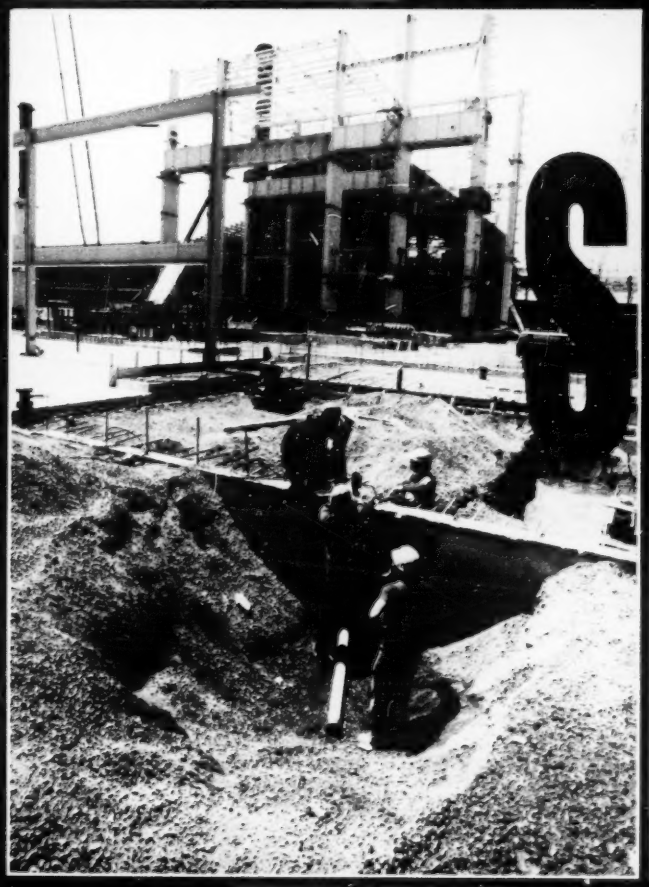

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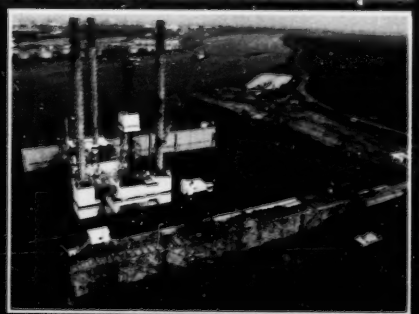

...DESPITE HARD TIMES

ADVANCES IN STEEL TECHNOLOGY

DETAILS ON THE USS/POSCO PLANT

SEPTEMBER 5, 1986 VOL. 229, NO. 17

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AISE CONVENTION ISSUE

OPERATION BOOTSTRAP:

STEEL SPENDING...

...DESPITE HARD TIMES

BY GEORGE MCMANUS

When you start adding things up, the steel industry has been doing a remarkable amount of modernizing.

This year's *Iron Age* survey of new facilities turned up 11 big continuous casters, 13 ladle metallurgy systems and five electrogalvanizing lines.

It goes without saying that these massive new units are equipped with sophisticated process controls. New controls are also going on existing facilities of large and small companies.

In El Paso, Border Steel Mills, Inc., is installing a distributed computer control system. Lukens, Inc., is automating its 110-inch plate mill and its 140-inch plate mill. Lukens is applying distributed control and materials tracking throughout its operation.

In addition to specific modernization projects on its 80-inch hot strip mill and 56-inch tandem mill, Inland Steel has completed more than a dozen automation projects. National Steel has put shape control on cold mills at Great Lakes, Midwest, and Granite City.

A sleeper in the steel picture is eccentric bottom tapping of electric furnaces. Seven furnaces are being converted to bottom tapping.

There are other active areas, but continuous casting is clearly the dominant element is the current modernization. According to the American Iron & Steel Institute (AISI), more than 48 pct of the domestic steel output was continuously casted in March 1986. That compared with 20 pct in 1981.

Considering the depressed state of the industry, the rapid conversion to continuous casting is impressive. Much of the impetus for the caster programs and all recent spending has come from rising customer quality standards.

Quality was a major consideration in the decision of USX Corp. to spend $300 million at Gary Works on a casting complex with capacity of 3.3 million tons.

"This caster gives us the continuous quality capability we need to meet those customer requirements," said Thomas C. Graham, president of USS.

Cost reduction is, of course, a major factor. The savings with continuous casting average around $50 a ton. For the U.S. industry as a whole, the casters now in place should reduce costs by more than $1.7 billion in 1986.

This helps explain why the cost of producing carbon steel has been cut $75 a ton since 1982. Since 1972, modernization has reduced energy consumption by 26 pct to 24.6 million Btu a ton.

The two biggest projects now underway in North America are the $300 million cold finishing system of USS-POSCO Industries at Pittsburg, Calif., and the new $750 million primary complex of Dofasco at Hamilton, Ont.

In both cases, the companies are taking advantage of clean slates to arrange facilities in a manner that permits a continuous flow of steel from one step to another.

The USS-POSCO mill reflects this trend toward close coupling, but it also reflects the different trend away from full integration and self-sufficiency. Hot bands for the mill will come from Korea.

California Steel Industries, Inc., and Tuscaloosa Steel are among the others relying entirely on outside sources for semifinished material. Weirton Steel Corp. is operating without coke ovens. The big mills tend to regard captive iron ore operations as burdens rather than assets.

The mini-mills continue to broaden and upgrade product lines. The most dramatic developments are at Nucor Corp., where casting programs are aimed at near net shape casting of sheet and heavy structural steel.

The new Fort Smith mill of Quanex Corp. is equipped for vacuum arc degassing, ladle injection and argon stirring.

At Monroe, Mich., North Star is

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installing a ladle furnace and converting an arc furnace to eccentric bottom tapping. In Youngstown, North Star is building the world's first mini-mill for oil country seamless casing.

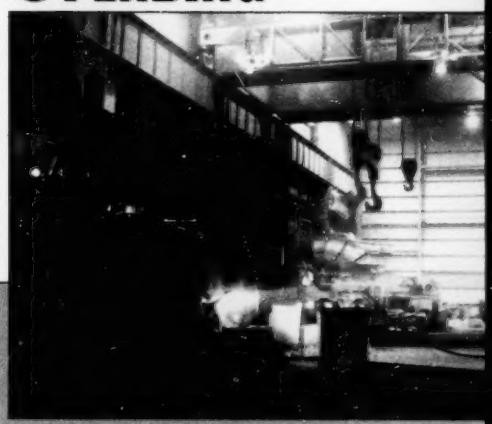
Dofasco

At Hamilton, Ont., Dofasco is building a complete new steel mill. The hot end of this monumental undertaking is well advanced. The cold finishing complex will come later.

To facilitate direct rolling, Dofasco is positioning its new continuous caster near the new hot strip mill. "From the cut-off of the caster to the roll bite of the roughing mill will be about 330 meters," said David H. Samson, engineering vice president for Dofasco.

The caster will be served by a

STEEL SPENDING



Timken completed construction of its $500 million Faircrest plant last year.

Despite an absence of profits, the steel industry has somehow managed to continue modernizing at a brisk rate. Here's a list of the projects completed or initiated since the start of 1985:

ACME STEEL CO.

A recently completed $15.5 million expansion program included:
–Stelco Coil Box added to strip mill.
–Slab and billet grinder.
–Two new slitter-painter lines for strapping.

ALLEGHENY LUDLUM STEEL CORP.

In the five years Allegheny Ludlum has operated as an independent specialty steel manufacturer, it has reinvested over $95 million in new and modernized facilities. These have included:

West Leechburg, Pa.
–A new state-of-the-art annealing and pickling facility.
–Modifications of slitting, bundling and shipping stainless strip.

Lockport, N.Y.
–Purchase and renovation of former Guterl Steel facility.

Claremore, Okla.
–An expansion of the tube facility.

Wallingford, Conn.
–A horizontal strip bright annealing line.
–New tension leveling line.
–Light gage slitting line.

Brackenridge, Pa.
–A downcoiler pinch roll assembly.
–Electrical renovation on a 56-inch. hot strip mill.
–Screwdown position regulators on a 56-inch cold tandem mill.
–Arc furnace aisle crane upgrade.
–Cell scale installation.
–Upgrade 25KV power distribution system, continuous caster water supply, and compressed air systems.

New Castle, Ind.
–Terminal assemblies for Sendzimir mill.
–Modifications to wet strip grinding and polishing line.

ARMCO INC.

Middletown, Ohio
–A new electrogalvanizing line, built at a cost of $50 million.

Butler, Pa.
–A $55.8 million state-of-the-art cold rolling mill.

BABCOCK & WILCOX, TUBULAR PRODUCTS DIV.

Alliance, Ohio

A $28 million modernization program includes:
–10/34-inch heavy wall welding mill.
–An induction heating unit.
–A 26-stand hot stretch-reducing mill.
–A 500,000-pound drawbench.
–A full-periphery ultrasonic testing unit.
–Several units of highly automated finishing equipment.

Koppel, Pa

A $14 million bar finishing facility includes:
–Quench Furnace.
–Temper Furnace.
–Rotary Straightener.
–Related finishing equipment.

No. 4 Melt Shop – $80 million modernization includes:
–An 80-ton ultra-high-powered furnace.
–A ladle refining station.
–A four-strand continuous bloom/bar caster.
–A state-of-the-art computer hierarchy.

BETHLEHEM STEEL CORP.

1985/86 major capital projects for Bethlehem totaled $770.5 million. Projects included:
–Installation of two slab casters.
–Modernization of a structural mill.
–Addition of new facilities.
–A new electrogalvanizing line.

Sparrows Point, Md.
–A $260 million continuous slab/bloom caster.

Burns Harbor, Ind.
–A $250 million continuous slab caster.
–A $14 million BOF shop ladle handling and treatment facility.
–A $13.5 million hot metal desulfurization station.

Steelton, Pa.
–An $18 million, long-length rail manufacturing facility.

Bethlehem, Pa.
–A $50 million modernization of the 48-inch structural mill.

Walbridge, Ohio
–An $82 million electrogalvanizing line, which is a joint venture of Bethlehem Steel, Inland Steel and Pre-Finish Metals, Inc.

Port Arthur, Tex.
–A multi-million dollar drydock at the Sabine Yard.

BORDER STEEL MILLS, INC.
–A heat treat line has been installed.
–A baghouse installation is in progress.

degassing system that places ladles inside a vacuum chamber and produces very low carbons.

Steel will flow from the ladle into a single tundish. "We want a very big tundish obviously," said Mr. Samson.

The tundish will feed two strands. "We'll be able to adjust widths on the fly and have all the shrouding, of course," said Mr. Samson. "There will be automatic mold level control and automatic tundish control."

Coming out of the molds, the slabs will be subjected to mild, air mist cooling and travel in insulated passages. "We cool it only enough to make a formable skin," said Mr. Samson. Closely spaced segmented rolls will support the strand, which will leave the caster at more than 1,000°F.

Dofasco won't be direct rolling right off the bat. "We have to have edge heating and we won't have that initially," said Mr. Samson. He feels the company must walk before it tries to run.

"First, we must learn to make slabs and then quality slabs and then predictable quality slabs and then enough of them to match the capability of the strip mill."

It will take a couple of years to reach the final point, but Dofasco is already equipping its strip mill for direct rolling.

"We're putting in stands six and seven with hydraulic screwdown," said Mr. Samson. "The existing stands four and five will have hy-

–A distributed computer control system is being implemented.

CARPENTER TECHNOLOGY CORP.

Capital improvements in 1985 totaled about $125 million. This covered:
–A bar finishing building with a centerless bar turner, straightening press, bar polisher and abrasive cut-off machine.
–The reversing mill portion of the new No. 5 Hot Mill is in production.
–Coil-to-bar cold drawing equipment.
–A sludge drying process for the waste treatment plant.
–Ladle heaters.

CF&I STEEL CORP.

–A 540,000 ACFM baghouse transferred from the BOF to arc furnace.
–First commercial production of head-hardened railroad rail in the U.S. in the third quarter of 1986.

CHAPARRAL STEEL CO.

Chaparral continues to invest 15 pct of pre-tax profits. The company expects to produce and ship 1.2 million tons of finished product in fiscal year ending May 1987. This will be up from 1.087 million tons in the year ending May 1986.
Projects include:
–Addition of two continuous casting strands to accommodate 1.5 million tons of melting capacity.
–Conversion this summer of one furnace to eccentric bottom tapping, increasing capacity from 115 tons before to 150 tons.
–Addition of more wide flange beam sizes on section mill.

CYCLOPS CORP.
Coshocton Stainless Division

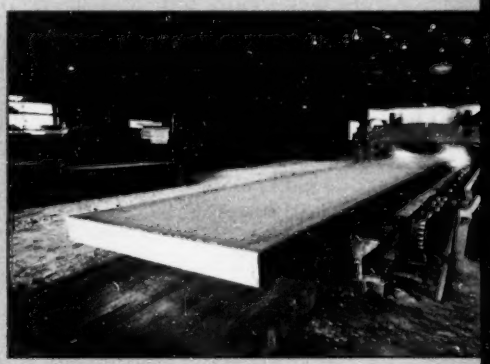
–A $27 million expansion program announced in January 1985 included.
–A 52-inch reversing Z-mill which should be operating in September.
–A 48-inch tunnel annealing furnace, scheduled for 1987.
–An additional 36-inch bright annealling line.
–A modified unibrite line.
–A new grinder and slitter.
–More than 45,000 sq ft of new production area under roof.

DOFASCO INC.

A $750 million (Canadian dollars) major expansion and modification program underway at Dofasco includes:
–A new continuous casting facility.
–A new No. 4 Pickle Line.
–Additional stands to the new No. 2 Hot Strip Mill.
–Two 350-ton slab furnaces.
–Additional equipment to No. 2 Melt Shop.
–No. 4 BOF vessel together with ladle metallurgy.
–A ladle heating station with a top argon lance.
–A new charging crane.
–Scrap yard facilities.

FLORIDA STEEL CORP.
Tampa, Fla.

–A 35-ton alternating current electric arc furnace was converted to direct current operation in March 1986.
–Plans were announced to relocate the Tampa Reinforcing Steel Fabricating Plant and Division Offices in June 1986.
Jacksonville, Florida
–A new rod rolling mill became operational in September 1986.
Charlotte, N.C.
–A new rolling mill became operational in May 1985.
–Plans were announced to relocate the Charlotte Reinforcing Steel Fabricating Plant and Division Offices in early 1987.



Lukens is modernizing its slab caster and automating two plate mills.

KEYSTONE STEEL & WIRE CO.

–Addition of AMB spray-cooled molds and mold level controls to the continuous caster.
–Installation of water-cooled oxygen lances for the arc shop.
–Restoration of pouring reels.
–Modernization of billet yard has included: Installation of radio controls for cranes, an upgrading of crane capacity as well as new lifting devices.

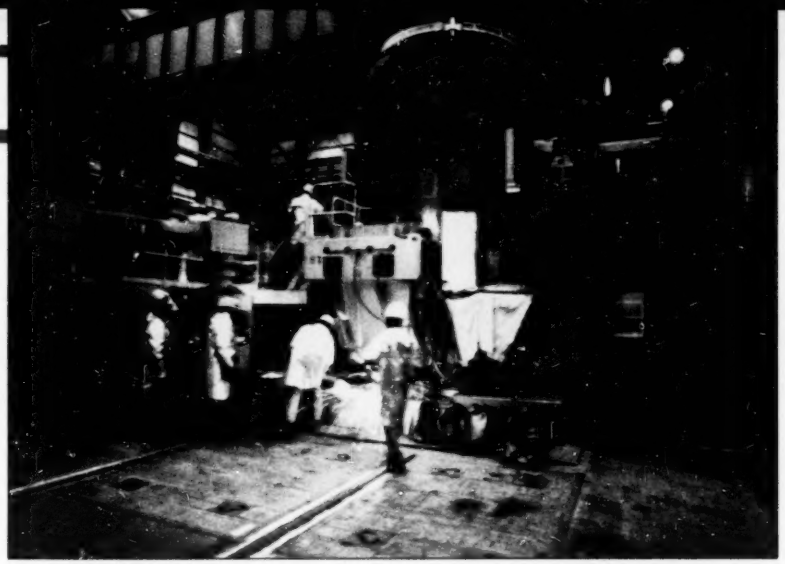
STEEL SPENDING

draulic screwdown. All stands will have work roll bending and hydraulic work roll shifting."

Work roll shifting will facilitate direct rolling by permitting schedule-free operation. "You can do almost as much as with a six-high mill," said Mr. Samson.

Process Control

Basic steel is probably the most advanced of any industry in its use of computer controls. The sophistication of modern steel controls is brought out by this de-



Inland has installed a slab caster and a combination slab/bloom caster.

–Installation of cover on caster ladle.
–Purchase of coil compacter for rod dock shipping.
–Installation of variable speed drive on furnace fan.

INLAND STEEL CO.
–A $26.5 million metallurgy station.
–A slab caster and a combination slab/bloom caster.
–A $17 million modernization project at the 56-inch Tandem Mill.
–Improvements at the 80-inch Hot Strip Mill.
–More than a dozen process automation installations were completed.
–Additional improvements at No. 4 BOF and at No. 4 Slabbing Mill.
–Overall environmental projects underway or completed totaled $27 million. These included: A coke side shed at No. 11 Coke Oven battery, an electrostatic precipitator at No. 9 Coke Oven battery, a secondary emissions control system, and Phase III of a waste water recycle system.

LACLEDE STEEL CO.
An estimated $4.4 million was spent during 1985 for plant modernization, with another $9.6 million projected to be spent during 1986. Major projects include:
–Revamp of the continuous casting facility.
–Completion of water cooled roofs.
–Providing alloy additive system.
–Rebuild of soaking pits.

LTV STEEL CO.
Cleveland, Ohio
–An electrogalvanizing line.
–BOF vessel bottom stirring - No. 2 BOF.
–C-6 Blast Furnace reline.
Canton, Ohio
–Ladle metallurgy station.

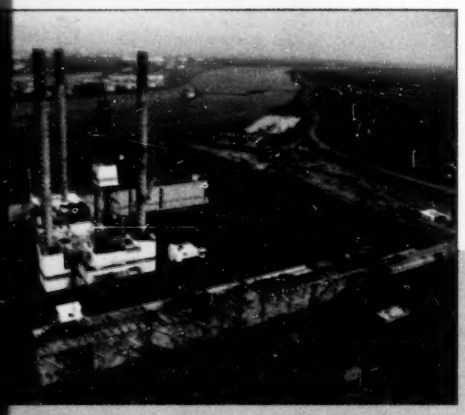
LUKENS, INC.
–Complete rebuilding of 165-ton furnace completed.
–Automation of 110-inch plate mill due for completion in summer of 1986.
–Automation of 140-inch plate mill will start in late 1986 or early 1987.
–Modernization of slab caster.
–Broad application of distributed controls and materials tracking systems.

MCLOUTH STEEL PRODUCTS CORP.
–Hot mill computer.
–An iron desulfurizing station.
–A 350-ton per hour slab heating furnace.
–A ladle metallurgy station.
–New data logging equipment.

NATIONAL STEEL CORP.
Projects completed or launched by National since the start of 1985 totaled more than $365 million.
Great Lakes Division
–A $120-million electrogalvanizing line began operation on December 26, 1985.
–An additional $20 million was spent to upgrade other steelmaking and rolling processes.
–Construction began in 1985 on a $200 million continuous caster and ladle metallurgy system. The caster is scheduled to begin operation in mid-1987.
–Ground was broken in May 1986, for a hot metal desulfurization station.
–Shape controls were installed on the No. 3 Temper Line.
Granite City Division
–A desulfurization station was completed and began operation early in 1986.
–A ladle metallurgy station went on-stream in August.
–Shape controls were installed on the tandem mill.
Midwest Division
–In 1985, $25 million of a $100 million corporate-wide, computer-based process control and management system was invested. Process controls have been installed on a number of operations in the past year and are currently running the galvanizing lines.
–Operation of a tension leveler began on August 27, 1985.
–Shape controls were installed on the 80-inch tandem mill.

NEW JERSEY STEEL CORP.
An expansion program announced in June 1986 will increase capacity from 350,000 tons a year to 500,000 tons a year. New facilities will include:
–An electric furnace with eccentric bottom tapping.
–Scrap cranes.
–A runout cross transfer and cooling

STEEL SPENDING



Bethlehem has built a multi-million drydock at its Sabine Yard in Texas.

bed.
–Provision for hot charging billets.

NORTH STAR STEEL CORP.

Youngstown, Ohio
–Idle mini-mill of Hunt Energy Co. acquired for $22.5 million and renamed North Star Steel Ohio.
–$80 million program will equip mill to make 250,000 tons of seamless oil country casing.
Beaumont, Tex.
–A $3 million update of rolling mill completed as part of $25 million improvement program.
–A $4.5 million melt shop project that includes conversion to eccentric bottom tapping.
Monroe, Mich.
–A $28 million program includes conversion to eccentric bottom tapping, a ladle furnace, and billet caster improvements.
Calvert City, Ky.
–Entered medium structural market by acquiring 80 pct of stock of Ohio River Steel Corp.

NORTHWESTERN STEEL AND WIRE CO.

–A six-strand bloom caster.
–An eight-strand billet caster.
–Seventeen insulated hoods on the rod conveyor line of 12-inch mill.
–Ladle refining at the continuous caster department, a computer-assisted operation.
–Plans for a $4 million capital improvement program for the Wire Products Division were announced by Northwestern. The project to be completed during fiscal year 1987, includes: Construction of a new cleaning house for rod; purchase of new wire drawing machines, updating the wire annealers, new nail cutting machinery, reorganizing existing nail manufacturing equipment.

NUCOR CORP.

Capital spending was $29.1 million in 1985 and $26.1 million in 1984. Projects include:
–New 600,000-ton structural mill under consideration.
Indiana
–$25 million fastener plant.
Darlington, S.C.
–Hazelett thin slab caster.
–Continuous steelmaking program.
Jewett, Tex.
–Eccentric bottom tapping conversion.
Plymouth, Utah
–Bar mill added.

QUANEX CORP.

The MacSteel Division of Quanex dedicated a complete new 280,000 bar mill at Fort Smith, Ark., in April 1985. Facilities include:
–A rotary continuous caster.
–A vacuum arc degassing system.
–Scanlance ladle injection and argon stirring.
–A 10-stand rolling mill.

RARITAN RIVER STEEL CO.

A $5 million project covers:
–A new billet conditioning facility.
–A remodeled 30,000 sq ft building.
–A B.C.P. shotblaster.
–A C.M.I. grinder.

ROUGE STEEL CO.

–Two-strand, $150 million slab caster.
–Double Eagle Steel Coating Co., a joint venture with USS, started $200 million, 700,000-ton electrogalvanizing line in April 1986.

STEEL OF WEST VIRGINIA, INC.

–$20 million automation of special section mill and fabricating equipment.
–Automation of a 21-inch special section hand mill.
–Installation of a 32-inch breakdown mill.
–Installation of a 32-inch universal finishing stand.
–Installation of equipment to paint and fabricate cutting edges, track shoes, turnouts, cross-members, and sub-frames.

SHARON STEEL CORP.

–A PEC hot metal desulfurization unit.
–Installed Lectromelt water cooled panels.
–New electrode arms.
–A second ladle preheater.
–Installed Peabody electrostatic oilers.
–An Accu-Ray 7000 thickness gage.
–An Ideal Corp. resistance butt welder.

STELCO INC.

Hamilton, Ontario
–A $60 million program to modernize No.1 bar mill includes:
–A new hearth-walking beam furnace.
–Twelve new roughing and intermediate stands.
–No. 2 cold shear, coiling and coil

scription of the computer system for the new slab caster at the Gary Works of USX Corp.

"At the rate of 1.5 million instructions per second, each of the three new superminicomputers make up the heart of the new control systems....

"The Level Two computers controlling Q-BOP and caster operations, as well as receiving and analyzing volumes of data which include the latest in tracking and quality information, receive information from more than 100 programmable logic controllers.

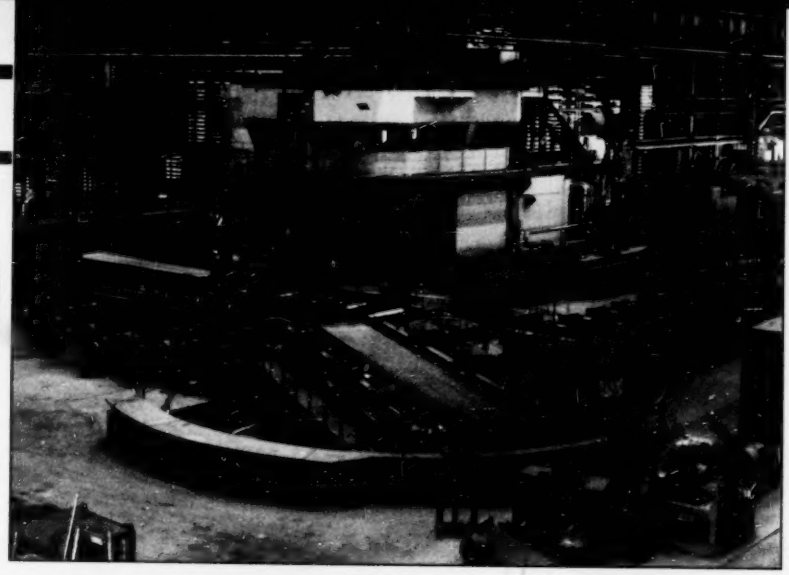
"These Level One micro-computing units include everything from the units tied into chemical analysis and testing at the chemical laboratory to the operator consoles which provide a window to every aspect of the process.

"Nearly 9 billion bits of information can be kept in on-line disk files with real-time access. The

STEEL SPENDING

computer tracking is so thorough that data will be assembled for each foot of steel cast by the lines and it will include approximately 200 variables with such information as chemistry, temperature, speed of the line....

"Running at capacity," the explanation concluded, "the computer tracking information could amount to as much as a catalog of 800 million variables on slabs produced annually." □



Bethlehem has installed a continuous slab caster at its Burns Harbor plant.

handling equipment.
–A $280 million continuous casting facility includes:
–One slab caster.
–Combination slab/bloom caster.

Lake Erie Works
–A $40 million quality improvement program is underway for the 2050 mm hot strip mill. This includes: Addition of a fifth finishing stand, increased horsepower on existing four finishing stands, and hydraulic automatic gage control.

STRUCTURAL METALS, INC.
–100-135 ton-per-hour walking beam reheat furnace.
–100/135 ton-per-hour cooling bed.
–Billet weighing system.
–Mill speed up to 2,500 fpm.
–Additional finishing facilities.
–Electric furnace modification.
–Sixteen pass in-line mill.

TELEDYNE ALLVAC
–A new rolling mill, the 26/36-inch Precision Rolling Mill, was recently completed.
–Rotary hearth furnace added.
–A joint venture with Teledyne Vasco, which began in December 1985 includes a 25-ton AOD facility in Latrobe, Pa.

THE TIMKEN CO.
Canton, Ohio
–A $500 million construction project, Faircrest Steel Plant, was completed and is operating.

Harrison Steel
–A ladle refining system.

TUSCALOOSA STEEL CORP.
–New $75 million mill to roll 112-inch wide coiled plate.

USX CORP.
Braddock, Pa.
–Reline and improvements to No. 3 Blast Furnace.

Dearborn, Mich.
–Electrogalvanizing line joint venture with Rouge Steel.

Gary, Ind.
–New slab caster.
–New ladle metallurgy complex.
–Reline and improvements to No. 7 Blast Furnace.

Fairfield, Ala.
–New slab caster being engineered.

Pittsburg, Calif.
–USS-POSCO Industries, a joint venture with Pohang Iron & Steel, is building a $300 million cold finishing complex.

Jackson, Mich.
–Joint venture with Worthington Industries will provide first operation blanks to auto plants.

West Mifflin, Pa.
–Modernization of Galvalume line.

WASHINGTON STEEL CORP.
Washington, Pa.
–A revamping of the No. 3 A & P Line, completed.
–New terminal equipment installed.
–Catenary annealing furnace began operation in March 1985.
–Microprocessor based automatic gage control added to the No. 3 Sendzimir Mill, also equipped with new isotope thickness gages, began operation in March 1986.

Houston, Pa.
–Completed a repowering of the reversing roughing mill on the Hot Strip Mill.

WEIRTON STEEL CORP.
Weirton will spend $78.8 million on capital improvements in 1986. Projects include:
–External desulfurization system due for late 1987 start-up.
–Two BOFs being equipped for bottom stirring.
–Two vacuum degassers being upgraded and equipped for reheating.
–$17 million modification of continuous caster completed.
–Upgrading of hot strip mill includes gage and shape controls, reheat retention covers, and water cooling system.
–No. 8 Temper Mill being installed on hot strip mill.
–Scanning X-ray gages being installed on hot strip mill.
–Closed loop coating weight system being added to one timing line. Microprocessors on other lines monitor coating weight during application. All lines will eventually have closed loop system.

WHEELING PITTSBURGH STEEL CORP.
–A 60-inch, 270,000-ton cooling line due for late 1987 start.

Monessen, Pa.
–New melting facilities under consideration.